



ఆంధ్రప్రదేశ్ రాజపత్రము

THE ANDHRA PRADESH GAZETTE PUBLISHED BY AUTHORITY

RULES SUPPLEMENT TO PART I EXTRAORDINARY

No.8

AMARAVATI, THURSDAY, DECEMBER 10, 2020

G.532

NOTIFICATIONS BY GOVERNMENT

--X--

ANIMAL HUSBANDRY, DAIRY DEVELOPMENT & FISHERIES DEPARTMENT (FISH)

THE ANDHRA PRADESH FISH FEED (QUALITY CONTROL) RULES, 2020.

*[G.O.Ms.No.45, Animal Husbandry, Dairy Development & Fisheries (Fish),
10th December, 2020.]*

NOTIFICATION

In exercise of the powers conferred by sub-section (1) of Section 27 of the Andhra Pradesh Fish Feed (Quality Control) Ordinance, 2020 (Ordinance No.7 of 2020), the Government hereby make the Andhra Pradesh Fish Feed (Quality Control) Rules, 2020 which are appended to this Notification.

The Indian Standards (BIS) for fish feeds specifications shown in Annexure-I to this rules shall be complied.

Dr. POONAM MALAKONDAIAH,
Special Chief Secretary to Government (FAC).

ANDHRA PRADESH FISH FEED (QUALITY CONTROL) RULES, 2020
(G.O.Ms.No.45, AHDD&F (Fish) Department, dt:10.12.2020)

CHAPTER-I
PRELIMINARY

1. Short Title and commencement:-

- (1) These rules may be called the Andhra Pradesh Fish Feed (Quality Control) Rules, 2020
- (2) They shall come into force at once.

2. Definitions:-In these rules, unless the context otherwise requires:

- (1) "APSADA" means the Andhra Pradesh State Aquaculture Development Authority established under the APSADA Act, 2020;
- (2) "Controlling Authority" means the Fish Feed Controlling Authority;
- (3) "Fee" means any fee stipulated in these rules;
- (4) "Form" means form annexed to these rules or annexed to the Andhra Pradesh State Aquaculture Development Authority Rules, 2020;
- (5) "Notification" means a notification published in the Gazette;
- (6) "Ordinance" means Andhra Pradesh Fish Feed (Quality Control) Ordinance 2020;
- (7) Words and expressions used herein and not defined, but defined in the Andhra Pradesh Fish Feed (Quality Control) Ordinance, 2020 or the Andhra Pradesh State Aquaculture Authority Act, 2020 or Andhra Pradesh State Aquaculture Authority Rules, 2020, shall have the meaning assigned to them in that Ordinance, Act or Rules as the case may be.

CHAPTER-II
FUNCTIONS & POWERS OF AUTHORITIES, COMMITTEES & LABORATORIES

3. Functions and Powers of the Fish Feed Controlling Authority:- The Fish Feed Controlling Authority (herein after called as Controlling Authority) shall be the overall supervisory and executive Authority of the Ordinance at State level and shall have the following functions and powers:

- (1) to take all necessary measures to implement the provisions of the Andhra Pradesh Fish Feed (Quality Control) Ordinance, 2020 in the State;
- (2) to monitor, regulate and promote the production, distribution and sales of Quality Fish Feed in the State;
- (3) to arrange for preparation of standards for fish feeds for any new fish species with the help of fishery related research and development institutes of both Central and State Governments and get them approved by the Fish Feed Quality Control Committee and BIS as per the procedure laid under these rules (see Rule No.11);
- (4) to examine and dispose the appeals preferred by any aggrieved licensee/applicant or any other person.
- (5) to carry out any other function

- (6) Controlling Authority shall have the powers required to carry out the above functions.

4. Functions and Powers of Fish Feed Quality Control Committee:- The Fish Feed Quality Control Committee (hereinafter called as Committee) shall have the following functions and powers:

- (1) to advise the Controlling Authority on implementation of the Ordinance and to provide technical basis for decision making by the Controlling Authority.
- (2) to provide independent technical and scientific advice and expert inputs and to assist the Controlling Authority in implementing of Ordinance
- (3) to monitor and evaluate the implementation of the Ordinance on the field
- (4) to propose the establishment of subsidiary bodies to work on specific technical issues or to provide a specified output.
- (5) to recommend third party technical agencies to carry out various tasks like sample collection, sample analysis, etc.
- (6) to provide information on Fish Feed production and other data relevant to the Ordinance in such a way as to enable the Controlling Authority to implement the Ordinance effectively.
- (7) any other function assigned by the Controlling Authority
- (8) the Committee shall have the following powers:-
 - (i) to enter into any premises where Fish Feed Business Operations are being carried out for the purpose of technical evaluation and audit.
 - (ii) take samples of any Fish Feed for the purpose of technical evaluation and audit
 - (iii) gather information or data from any Fish Feed Business Operations for the purpose of technical evaluation and audit
 - (iv) to suggest technical corrective measures to Fish Feed Business Operations if such need arises
 - (v) while inspecting / auditing, if the Committee finds any deviations in the implementation of the provisions of the Ordinance, it shall have the powers to recommend action against the erring individual/firm/company
 - (vi) it shall have other powers that are essential to discharge functions assigned to it.
 - (vii) to form sub-committees / to constitute teams and to assign some of its functions to them
 - (viii) The sub-committees / teams constituted under clause (vii), shall have the powers listed under clauses (i) to (vi)
- (9) Fish Feed Quality Control Monitoring Cell shall be established at Office of the Controlling Authority for day-to-day monitoring of the implementation of the Ordinance and these Rules. This Cell shall giving necessary clarifications/instructions to Licensing Authorities / FFI/Analysts/others, to do liaison work, obtain data, compile reports and carryout all the related work at State level.

5. Functions and powers of Licensing Authority:- The Licensing Authority is the supervisory and executive Authority of the Ordinance and shall have the following Functions:

- (1) to supervise the implementation of the Ordinance in the District;
- (2) to issue licenses/endorsements for Fish Feed Business Operations in the District;
- (3) to monitor, regulate Fish Feed Business Operations in the District;
- (4) in case of violations of the provisions, to suspend/cancel license/endorsements in the District;
- (5) Any other function;
- (6) to ensure that the fish feeds sold or intend to be sold in the District comply with the quality standards as per the provisions of the Ordinance and these rules;
- (7) if necessary, constitute teams with the officers of line departments for effective implementation of the provisions of the Ordinance;
- (8) to issue orders to stop/ close any Fish Feed Business Operations in the District;
- (9) to ensure all the fish feed manufactured in other states or other countries and sold in the State comply with the Quality Standards as laid down under these Rules;
- (10) All the powers required to carry out the functions assigned to him/her.

6. Functions and Powers of Fish Feed Inspector:- The Fish Feed Inspector (hereinafter called as Inspector) is the field level enforcing officer under these rules and shall have the following Functions and Powers:

- (1) to execute the provisions of the Ordinance and these rules at field level.
- (2) to assist the Licensing Authority for issue licenses/endorsements for fish feed business operations in the District
- (3) to assist in the Licensing Authority in monitoring and regulating the Fish Feed Business Operations in the District
- (4) the Inspector shall have the following powers:-
 - (i) to enter and search the premises in which Fish Feed Business Operations are being undertaken
 - (ii) In case if any product with a rectifiable defect is found, the Inspector shall be empowered to order not to sell such defective product for a period not exceeding seven (7) days or till the alleged defect is rectified whichever is earlier. If such defect is not rectified within a given period of seven (7) days, the Inspector shall seize such defective product from the Licensee;
 - (iii) to assist the Licensing Authority to ensure that the fish feeds sold or intend to be sold in the District comply with the quality standards as per the provisions of the Ordinance and these rules
 - (iv) take samples of fish feed from Fish Feed Business Operators and send the samples to Regional/ Referral fish feed analysis Laboratories for analysis
 - (v) Sending the analysis reports to the Licensing Authority for taking further action.
 - (vi) examine any record, register, document or any other material object found in any place where fish feed business operations are being carried out and seize the same
 - (vii) to break any physical facilities in the presence of Designated Committee in case of non-cooperation of Licensee

- (viii) All the powers required to carry out the functions assigned to him/her
- (ix) Any other power assigned by the Controlling Authority

Functions of Fish Feed Analysis Laboratory:

- (1) The Fish Feed Analysis Laboratory (hereinafter called as Laboratory) is the facility in which the Fish Feed samples are analysed under provisions of this Ordinance and rules.
- (2) The samples received at the Laboratory are to be properly preserved, analysed and the results are to be reported as per the procedure described under Rule 18 of the APSADA Rules, 2020.
- (3) The Fish Feed Analyst at such Laboratory shall follow the procedure described in detail under the Rule 19 of the APSADA Rules, 2020 for analysis of the samples received by him/ her and report the results of analysis thereafter.
- (4) APSADA Form No. 27 shall be used for forwarding the sample to Regional / empanelled Fish Feed Analysis Laboratory; APSADA Form No. 28 shall be used for forwarding the sample to Referral Fish Feed Analysis Laboratory and APSADA **Form No.30** shall be used for forwarding the sample to Government approved/ NABL Accredited Empanelled Private Laboratory (**only if Licensee requests in Form No.29**). APSADA Form No.32 shall be used for sending the report of analysis.

CHAPTER-III

FISH FEED BUSINESS OPERATIONS ETC.

8. Fish Feed Business Operations:

- (1) General requirements to be complied by Fish Feed Manufacturers/ Distributors are given Annexure -IV.
- (2) The Fish Feed Business Operators shall maintain the following records:-
 - (i) License/ Registrations Certificates from Competent Authorities
 - (ii) Facilities and Infrastructure
 - (iii) Technicians and Staff Particulars
 - (iv) Safety Standards
 - (v) SOPS / Protocols
 - (vi) Sample / Quality testing
 - (vii) Inputs
 - (viii) Indents and Supply orders
 - (ix) Bill books / Invoices
 - (x) Sales Register
 - (xi) Annual Turnover Register
 - (xii) Accounts Register
 - (xiii) Audit Reports
 - (xiv) Inspection Register

9. Classification of Fish Feed Business Operations and Fee payable:

(1) The Classification of Fish Feed Business Operations along with fee payable for license/endorsement are as follows:-

Category	Description	License Fee/ Endorsement Fee (Lakhs)
Category – 1	Fish Feed Manufacturing (Large Scale) : Production capacity 1 lakh MT/Year and above	2.50
Category – 2	Fish Feed Manufacturing (Medium Scale): Production capacity 0.50 to 0.99 Lakh MT/Year	1.25
Category – 3	Fish Feed Manufacturing (Small Scale): Production capacity < 0.50 Lakh MT/Year	0.75
Category – 4	Fish Feed mixing/manufacturing for own usage within premises in which it is made	0.10
Category - 5	Manufacturing of fish feed ingredients and additives	1.25
Category – 6	Distribution of fish feed/fish feed ingredients/fish feed additives	0.50
Category – 7	Sale of fish feed / fish feed ingredients / fish feed additives	0.10
Other Services		
1	Approval for new Feed Ingredient/ Additive / Fish Feed variant / Functional Feed / Medicated Feed / Product	As per actual expenditure charged by third party agency + 20% APSADA Service charges
2	Certification (Accreditation) of Feed Plant (pl see sub-rule (3) of Rule 23 of the APSADA Rules, 2020)	
	a. Certification Charges	1.00
	b. Revocation of Suspension	0.50
3	Certification of Feed (pl see sub-rule (4) of Rule 23 of the APSADA Rules, 2020))	
	a. Certification Charges	1.00
	b. Revocation of Suspension	0.50

(2) The charges for other services are given in Annexure –II of the APSADA Rules, 2020.

(3) The charges given under sub-rule (1) of rule 31 are revisable from time to time as per sub-rule (2) of Rule 31 of the APSADA Rules, 2020

CHAPTER – IV

LICENSE / ENDORSEMENTS

10. Issuance of Licenses / Endorsement:

- (1) Provisions pertaining to endorsement/license under Section 8 of the Ordinance shall be applicable to all Licenses / endorsements under these Rules.
- (2) Endorsement / Licenses to Fish Feed Business Operators under this Ordinance and these rules shall be issued by APSADA.
- (3) The detailed procedure described under sub-rule (15) of Rule 12 of the APSADA Rules, 2020 for Endorsement and sub-rule (16) of Rule 12 of the APSADA Rules, 2020 for issuance of License shall be followed in this regard.
- (4) Fees payable for Licenses / Endorsements are given in Rule 9 and these fees are likely to be revised from time to time as per the procedure described under Rule 31 of the APSADA Rules, 2020.
- (5) The Licensee shall abide by the responsibilities as described under Section 16 of the Ordinance.

CHAPTER – V

QUALITY CONTROL, CERTIFICATION ETC.

11. The Standards of Fish feed:-

- (1) Fish Feed sold or intended to be sold in the State shall comply with the BIS Quality Standards as described under Section 12 of the Ordinance. The category -4 (Rule 9(1)) i.e. Fish Feed mixing/manufacturing for own usage within farm premises is exempted from quality standards prescribed under these rules if such feed utilized within the farm premises. In case if such feed is transported out of the farm premises in which it was made for any purpose including own usage in farms at other locations, exemption from the quality standards given under this sub-rule shall become null and void.
- (2) BIS Standards applicable as on the date for various species are given in the **Annexure – I**
- (3) If BIS Standards are not available for any of the approved species, Government of AP / FAO Standards shall be followed as described under sub-sections (4) and (7) of Section 12 of the Ordinance .
- (4) As and when any new Fish Feed Ingredient/ Additive / Fish Feed variant / Functional Feed / Medicated Feed / Product/ ornamental feeds / micro-encapsulated feeds / hatchery feeds is proposed by any Licensee, it shall be approved by the Committee and it shall be displayed on the Web portal by following procedure described under Rule 16.
- (5) As and when any Standards are prepared for any species for which BIS standards are not available, they shall be approved by the Committee and shall be displayed on the Web portal by following procedure described under Rule 17.
- (6) The fish feed shall not contain any antibiotic or pharmacologically active substances under any circumstances and shall be certified accordingly on a fish feed bag.
- (7) List of adulterant and their permissible limits in the fish feeds are given in Annexure-V

12. Labeling and Marking of Fish Feed Bags:

- (1) Every fish feed bag sold or intended to be sold in the State shall contain the following details printed legibly.
- (i) License No.
 - (ii) Declaration: For sale in AP
 - (iii) Name of the material (Name of Species & Life Stage) and brand name (if any)
 - (iv) Type of Fish Feed (Sinking / Floating)
 - (v) Name and address of the manufacturer
 - (vi) Net quantity when packed
 - (vii) Batch or Code Number
 - (viii) Date of Manufacture
 - (ix) Date of Import (if applicable)
 - (x) Date of Expiry
 - (xi) Conditions under which the fish feed is to be stored
 - (xii) Any other markings required under Legal Metrology (Packaged Commodities) Rules 2011.
 - (xiii) Standards followed (BIS/FAO/Govt. of AP)
 - (xiv) All ingredients in the feed shall be mentioned on the feed bag in their order of predominance. The percentage of all ingredients shall be mentioned on the feed bag. It is desirable to mention exact percentage of ingredients; however, if the feed manufacturer wishes not to reveal the exact percentage of ingredients, the percentage of ingredients shall be mentioned within a range of +/- 25 % of their inclusion in the feed.
 - (xv) Antibiotic, hormones & pharmacologically active substances free certificate
 - (xvi) Pesticides, Herbicides (if any)
 - (xvii) Moisture content (Max %)
 - (xviii) Crude protein content (Min %)
 - (xix) Crude fibre content (Max %)
 - (xx) Crude fat content (Min %)
 - (xxi) Acid insoluble ash . % by mass (Max)
 - (xxii) Aflatoxin B₁ content (Max %)
 - (xxiii) Gross energy (Min)
 - (xxiv) Storage conditions
- (2) Every fish ingredient bag sold or intended to be sold in the State shall contain the following details printed legibly.
- (i) Name of the material and brand name (if any)
 - (ii) Name and address of the manufacturer /importer
 - (iii) Net quantity when packed
 - (iv) Batch or Code Number
 - (v) Date of Manufacture
 - (vi) Date of Expiry
 - (vii) Storage conditions

13. Regional and Referral Fish Feed Analysis Laboratories:-

- (1) The list of Regional Fish Feed Analysis Laboratories and Referral Fish Feed Analysis Laboratory along with fee payable for various parameters are given in Annexure-III.
- (2) Till the establishment of regional laboratories, services of private laboratories empanelled by APSADA shall be utilized.
- (3) NABL accredited laboratories shall be given priority while empanelling.
- (4) System generated randomization method shall be followed for sending samples to such empanelled laboratories. Under any circumstances sample collected by a third party agency shall not be sent to laboratory being operated by same agency.
- (5) In case if required, services of empanelled laboratories may be continued to be utilized even after the establishment of regional laboratories.

14. Sample Collection and Analysis Procedures:

- (1) The procedure of giving notice for collection of the sample, collection, packing, sealing, marking, labelling, forwarding, etc. as described under the APSADA Rule 18 shall be followed.
- (2) The Fish Feed Inspector (FFI) / Sample Collector shall collect samples as per the schedule allotted to him/her through the system generated randomized method.
- (3) Sampling Frequency:
 - (i) There is no fixed frequency for the collection of samples from licensees
 - (ii) Samples are to be collected as and when required, however at least four samples are to be collected from each Licensee in a year, preferably once in every quarter. There is no limit on maximum samples that can be collected from a licensee
 - (iii) Sample collection is to be done by Sample Collector of third party technical agencies or Fish Feed Inspector as per the system generated randomization schedule. (please see the APSADA Rule 17)
- (4) The sample is to be collected only from sealed Fish Feed bag only.
- (5) In case of the collection of sample from farmer/consignee / purchaser (upon complaint), the Licensee shall be intimated online so as to provide an opportunity to the Licensee to make sure that reference sample from the same batch provided by him/her under sub-section (6) of Section 16 of the Ordinance is also analyzed along with the sample collected from purchaser or consignee.
- (6) Sample is to be collected only if the remaining time for expiry of Fish Feed is not less than seven (7) days.
- (7) If the expiry date is lesser than sixty (60) days from date of collection of sample, FFI / Sample Collector shall take all necessary steps to send the

samples to both Regional Fish Feed Analysis Laboratory as well as Referral Fish Feed Analysis Laboratory immediately with a special request (APSADA Form No.27 & APSADA Form No.28) to analyze the samples on priority basis well before the expiry date.

- (8) Every FFI/ Sample Collector shall maintain a register in which details of sample collection are to be recorded.
- (9) Cost of fish feed sample shall be paid to the Licensee in cash and receipt is to be obtained and shall issue a receipt of acknowledgement
- (10) Sample size, container type, and model, sealing method as described under the APSADA Rule 18(2) shall be followed.
- (11) The procedure and process described under the APSADA Rule 19 read with sub-sections (2), (6) and (7) under Section 18 of the Ordinance for shall be followed by the Analyst for analysis and report of Fish Feed samples
- (12) Procedure to be followed by the Licensing authority in case of receiving a request from Licensee for analysis by referral Laboratory described under the APSADA Rule 20 shall be followed.
- (13) Other procedures like time period for preserving the sample and disposal of sample etc., as described under the APSADA Rule 19 shall be followed.
- (14) In case if there is any variation in the results of Regional Laboratory / Referral Laboratory and NABL Accredited Private Laboratory, the result of Regional Laboratory / Referral Laboratory shall supersede over the result of NABL Accredited private Laboratory only if the concerned Regional Laboratory / Referral Laboratory has also got valid NABL Accreditation. In case if Regional Laboratory / Referral Laboratory does not have valid NABL accreditation, the result of NABL Accredited private Laboratory shall supersede over the result of Regional Laboratory / Referral Laboratory.

15. Procedure to be followed by the Fish Feed Inspector for breaking open any premises or in the case of non-cooperation by the Licensee:

- (1) This option shall be exercised only if the owner or any person in occupation of the premises refuses to allow the collection of sample(s).
- (2) In case of non-cooperation of the Licensee during the visit of Sample Collector, authorized by the Controlling Authority, he or she shall inform the Fish Feed Inspector; in case of non-cooperation of the Licensee during the visit of Fish Feed Inspector or on receipt of such information from sample collector, the Fish Feed Inspector shall inform the Designated Committee about the incident and shall intimate them about the details such as place, date and time of the process.
- (3) As far as possible, the process shall be carried out during day time only. Under emergency conditions it may be carried out during night time also.
- (4) The men and material required for the process shall be mobilized by the concerned Fish Feed Inspector well before the proposed date of the process.

- (5) The process shall be carried out only in the presence of the Designated Committee (as designated under sub-rule (8) of Rule 14 of the APSADA Rules, 2020).
- (6) Care shall be taken to cause no/ minimal damage to civil structure or any other material while carrying out the process.
- (7) The entire process shall be videographed invariably.
- (8) The sample shall be collected and / or seizure of the stock shall be done after breaking open the premises.
- (9) The inquest report shall be prepared (APSADA Form No. 34) by the Designated Committee.
- (10) The Fish Feed Inspector, after completion of the Inquest, shall submit Inspection Report (APSADA Form No. 35) online along with Inquest Record/ Report within three (3) days from the date of completion of Inquest to the Licensing Authority for information and further necessary action.
- (11) Upon receipt of such inquest report, the Licensing Authority shall take action as per the provisions under Offenses and Penalties.

16. Procedure for approval of a new fish feed: In case if any of the Licensee wants to get approval for a new Fish Feed Ingredient/ Additive / Fish Feed variant / Functional Feed / Medicated Feed / Product/ ornamental feeds / micro-encapsulated feeds/hatchery feeds, the following procedure shall be followed:-

- (i) The Licensee shall submit the sample of new product and Service request form (APSADA Form- 24), along with prescribed fee (See Rule 9), and results of research conducted by the Company itself or any other organization to the Licensing Authority.
- (ii) The Licensing Authority on scrutiny shall forward the application with sample(s) along with its recommendations to the Controlling Authority.
- (iii) On receipt of such application and sample, the Controlling Authority shall forward the application and sample(s) to the Fish Feed Quality Control Committee.
- (iv) On receipt, the Fish Feed Quality Control Committee shall do preliminary scrutiny of application and enclosures.
- (v) During preliminary scrutiny, if the Committee is not satisfied with the new product and documents of research result furnished, it may reject the application for approval directly without any further process and shall inform the applicant accordingly.
- (vi) If the Committee satisfies itself with the results of research conducted by the company or any other organization, such new feed ingredient/additive/ fish feed variant / functional feed / medicated feeds/product shall be approved.
- (vii) If the Committee is not satisfied with the results of the research conducted by the company or any other organization, the Committee shall refer the online research information to take a final view before taking the final decision on such new feed ingredient/additive/ fish feed variant / functional feed / medicated feeds/product.
- (viii) If the Committee is satisfied with the online research information, it shall approve such new feed ingredient/additive/ fish feed variant / functional feed / medicated feeds/product.
- (ix) If Committee is not satisfied with the online research information or if no such research information is available online, the proposed new feed

ingredient/additive/ fish feed variant / functional feed / medicated feeds/product shall be rejected.

- (x) This process shall be completed within (60) days from the date of receipt of application.
- (xi) On the recommendations of the Committee, the Controlling Authority shall issue directions to the Licensing Authority to issue License to the applicant, if applicant submit a service request for issue of License to new feed ingredient/additive/ fish feed variant / functional feed / medicated feeds/product.

17. Procedure for approval of fish feed for a new species: In case if any of the Licensee wants to get approval for Fish Feed for a new species, the following procedure shall be followed:-

- (i) The Licensee shall submit the sample of fish feed and application (APSADA Form-24), along with prescribed fee (See Rule 9), and results of field trials conducted any ICAR/State Agricultural Universities/Government institutions (if any) to the Controlling Authority.
- (ii) On receipt of such application and sample, the Controlling Authority shall forward the application and sample to the Fish Feed Quality Control Committee
- (iii) On receipt, the Fish Feed Quality Control Committee shall do preliminary scrutiny of application and enclosures.
- (iv) During preliminary scrutiny, if the Committee is not satisfied with the new product, it may reject the application for approval directly without any further process and shall inform the applicant accordingly.
- (v) If the Committee satisfies itself with the results of field trials conducted by any ICAR/ State Agricultural Universities/ Government institutions, such new fish feed may be approved directly.
- (vi) If field trials are not conducted (or) conducted by any person/ private institutions including NGOs, but the Committee satisfies itself that the new product is likely to be better than the existing products, the Fish Feed Committee may forward the sample to SVVU Fish Farms or Labs /State Fisheries Department Farms or Labs / Farms or Labs of any government organization/undertaking, for conducting field trials.
- (vii) On receipt of such request, the concerned institution will conduct the field trial and send the results of a field trial to the Fish Feed Quality Control Committee.
- (viii) If the Committee satisfies itself with the results of field trials, such new fish feed may recommend the Controlling Authority for the approval.
- (ix) On receipt of such recommendation, the Controlling Authority shall approve it.
- (x) This process shall be completed within 180 days from the date of receipt of the application.
- (xi) Subsequently, necessary action to be taken for approval of new fish feed by BIS.

18. Certification: Certification shall be done by APSADA with the help of Third Party Technical Agencies. Certification is done both to physical facilities of a Feed Manufacturing Unit (also referred to as ‘accreditation’) and also the Fish Feed

produced from that Feed Manufacturing Unit. For certification, procedure described under Rule 23 of the APSADA Rules, 2020 shall be followed.

CHAPTER - VI OFFENSES & PENALTIES

19. Offences and Penalties: Offences and penalties are listed in the Annexure-VI.

20. Seizure and Forfeiture of the stock:-

- (1) Offenses for which the fish feed is to be seized/forfeited is given in the Annexure-VI.
- (2) Procedure as described under Rule 25 of the APSADA Rules, 2020 shall be followed by the Inspector for seizure and forfeiture of the stock.

21. Cancellation/Suspension of Endorsements/ licences:;

- (1) If the Licenses commits an offense for which the Endorsement / License is liable to be suspended/cancelled as per the provisions of the Ordinance or these rules, a show-cause notice (APSADA Form-49) shall be issued to him/her online to show the reasons that why the endorsement/ license should not be suspended or cancelled, as the case may be.
- (2) The Licensee shall submit a reply to the show-cause notice with evidences, if any, within **thirty (30)** days in writing (APSADA Form-51) from the date of receipt of show-cause notice.
- (3) The Licensing Authority, if satisfied with the reply of the Licensee, may drop further proceedings in this matter.
- (4) If the Licensing Authority is not satisfied with the reply of the Licensee, may suspend or cancel the Endorsement/ License as per the provisions of the Ordinance or these Rules and shall communicate the same (APSADA Form-50) to Licensee accordingly. SMS and e-mail alert shall be sent to the Licensee and concerned Fish Feed Inspector in this regard.
- (5) In case of defects are rectified by the Licensee and reported (APSADA Form- 51), the Licensing Authority shall revoke the suspension.
- (6) License once cancelled cannot be re-issued under any circumstances.

CHAPTER – VII APPEAL

22. Appeal:

- (1) Any person who is aggrieved by the order passed by the Licensing Authority refusing to grant license /endorse a license; refusing to revoke suspension; passing order for cancellation; forfeiture / seizure of property and others may within thirty (30) days from the date of receipt of such order by him/ her, as case may be, and on payment of a fee (as given in

- Annexure-VI) prefer an Appeal (**APSADA Form No. 52**) to the Controlling Authority who is the Appellate Authority.
- (2) The Appellate Authority shall summon the Appellant (**APSADA Form No.53**) and the Licensing Authority/concerned officer (online intimation) along with all the supporting documents and shall hear the case physically or virtually.
 - (3) Based on the evidences and observations during hearing, the Appellate Authority shall dispose of the appeal within fifteen (15) days by issuance of necessary orders (**APSADA Form No. 54**)
 - (4) Every order passed by the Appellate Authority/ Controlling Authority on an appeal preferred, shall be final.

CHAPTER -VIII

MISCELLANEOUS

23. Forms and Formats:-

- (1) The list of Forms and Formats to be used for various purposes under the Ordinance and these rules are given in Annexure-II.
- (2) In case if any modifications required in various processes, formats, forms, etc. for operational convenience, such modifications shall be proposed by the Fish Feed Quality Control Committee and shall be submitted to the Controlling Authority for approval
- (3) The Controlling Authority shall be empowered to approve with /without modifications or reject the modifications and effect such modifications by means of executive orders

24. Powers to frame regulations:

- (1) In case if any procedures, process are to be elaborated or any clarifications are to be given with regard to provisions of the AP Fish Feed (Quality Control) Ordinance 2020 or rules there under, the Controlling Authority may frame regulations in consistent with the Act and Rules.
- (2) Whenever, regulations are to be framed under sub-section (1), the Fish Feed Quality Control Committee shall prepare the draft regulations and shall submit it to the Controlling Authority for approval.
- (3) The Controlling Authority shall have the powers to approve regulations in consistent with the AP Fish Feed (Quality Control) Ordinance 2020 and Rules.

Dr. POONAM MALAKONDAIAH,
Special Chief Secretary to Government (FAC).

Annexure- I

IS 16150 (Part 1) : 2014

Indian Standard

FISH FEED — SPECIFICATION

PART 1 CARP FEED

1 SCOPE

This standard (Part 1) prescribes the requirements and the methods of sampling and test for Indian major carp (*Catla catla*, *Labeo rohita* and *Cirrhinus mrigala*) feeds.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed in Annex A.

3 TYPES

Carp feed shall be of the following four types:

- a) *Carp Spawn Feed (CSF)* — feed to be fed to carp larvae up to age of 15 days/25 mm length.
- b) *Carp Fry Feed (CFF)* — feed to be fed to carp fry from 16th day to 90th day/25-100 mm length.
- c) *Carp Grow-out Feed (CGF)* — feed to be fed to carp from 4th month to harvesting.
- d) *Carp Brood Feed (CBF)* — feed to be fed to brood carp before 4 months of onset of breeding.

4 REQUIREMENTS

4.1 Description

The carp feed shall be free from rancidity, adulterants, moulds and insect infestation.

4.1.1 Ingredients

The ingredients listed in Annex B shall only be used for manufacturing carp feed.

4.2 The carp feed shall also conform to the requirements given in Table 1.

4.3 Antibiotics and Additives

If antibiotics or other additives are incorporated in to the carp feed, these shall be declared on the label. The use of any of the following antibiotics and other Pharmacologically Active Substances shall be prohibited in any unit manufacturing carp feed:

- a) All nitrofurans including, furaltadone, furazolidone, furylfuramide, nifuratel, nifuroxime, nifurprazine, nitrofurnatoxin, nitrofurazone;
- b) Chloramphenicol;
- c) Neomycin;
- d) Nalidixic acid;
- e) Sulphamethoxazole;
- f) Aristolochia spp. and preparations thereof;
- g) Chloroform;
- h) Chloropromazine;
- j) Cholchicine;
- k) Dapsone;
- m) Dimetridazole;
- n) Metronidazole;
- p) Ronidazole;
- q) Ipronidazole;
- r) Other nitromidazoles;

Table 1 Requirements for Carp Feed

(Clauses 4.2 and 7.1)

SI No.	Characteristics	Requirements				Method of Test, Ref to
		Carp Spawn Feed	Carp Fry Feed	Carp Grow-out Feed	Carp Brood Feed	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Moisture, percent by mass, <i>Max</i>	10	10	10	10	4 of IS 7874 (Part 1)
ii)	Crude Protein ($N \times 6.25$), percent by mass, <i>Min</i>	35	35	25	25	5 of IS 7874 (Part 1)
iii)	Crude fat, percent by mass, <i>Min</i>	8	8	6	6	7 of IS 7874 (Part 1)
iv)	Crude fibre, percent by mass, <i>Max</i>	6	8	8	8	8 of IS 7874 (Part 1)
v)	Acid insoluble ash, percent by mass, <i>Max</i>	2.5	3	3	3	10 of IS 7874 (Part 1)
vi)	Gross energy, kcal/kg, <i>Min</i>	4 000	3 500	3 000	3 000	Annex C
vii)	Poly unsaturated fatty acids (18:2n 6), percent by mass, <i>Min</i>	0.5	0.5	0.5	1	Annex D

NOTE — The requirements specified for characteristics (ii) to (vii) are on moisture-free basis.

IS 16150 (Part 1) : 2014

- s) Clenbuterol;
- t) Diethylstibestrol (DES);
- u) Sulfanoamide drugs (except approved sulfadimethoxine, sulfabromomethazine and sulfaethoxypyridazine);
- v) Fluoroquinolones; and
- w) Glycopeptides.

4.4 Aflatoxin B₁ content of the carp feed shall not exceed 0.01 mg/kg at the time of manufacture. Aflatoxin B₁ shall be tested by the manufacturer in accordance with the test method prescribed in IS 13427 or IS 14718* and declared on the label. Sampling of carp feed for estimation of aflatoxin B₁ content shall be done in accordance with IS 13426.

NOTE — In case of dispute, the method indicated by '*' in 4.4 shall be the referee method.

4.5 Physical Characteristics**4.5.1 Feed Form and Size**

4.5.1.1 Carp spawn feed shall be in the form of powder or granules of size less than or equal to 100 µm.

4.5.1.2 Carp fry feed shall be in the form of crumbles or pellets of diameter less than or equal to 0.2 mm and length less than or equal to 0.5 mm.

4.5.1.3 Carp grow-out feed shall be in the form of pellets of 2 mm to 5 mm diameter and 3 mm to 5 mm length.

4.5.1.4 Carp brood feed shall be in the form of pellets of 3 mm to 5 mm diameter and 5 mm to 8 mm length.

4.5.2 Water Stability of Pellets

The feed pellets should be stable without disintegration in water for 2 h minimum. The water stability shall not be less than 90 percent after 30 minutes when tested as per Annex E.

5 PACKING AND MARKING**5.1 Packing**

The material shall be packed in clean, dry and sound, plain or polyethylene-lined jute or laminated paper bags. The mouth of each bag shall be either machine stitched or rolled over and hand-stitched.

5.2 Marking

5.2.1 Each bag shall be suitably marked so as to give the following information legibly:

- a) Name of the material and brand name, if any;

- b) Type of the fish feed;
- c) Name and address of the manufacturer;
- d) Net quantity when packed;
- e) Batch or Code number;
- f) Date of manufacture; and
- g) Any other markings required under the *Legal Metrology (Packaged Commodities) Rules, 2011*.

5.2.2 In addition to the information listed in 5.2.1, each bag shall have a label or tag attached to it or contain a leaflet giving the following information:

- a) Type of the fish feed;
- b) Name and quantity of the antibiotic or additives added, if any;
- c) Moisture content;
- d) Crude protein content;
- e) Crude fibre content;
- f) Crude fat content;
- g) Aflatoxin B₁ content;
- h) Gross energy; and
- j) Direction for use.

5.3 BIS Certification Marking

The product may also be marked with the Standard Mark.

5.3.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations framed thereunder. The details of the conditions under which the licence for use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

Representative samples of the material shall be drawn according to the method prescribed in IS 1374.

7 TESTS

7.1 Tests shall be carried out as prescribed in 4.4, 4.5.2 and col 7 of Table 1.

8 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities, which affect the result of analysis.

IS 16150 (Part 1) : 2014

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
920 : 1972	Specification for common salt and cattle licks for animal consumption (<i>first revision</i>)		decorticated cottonseed oilcake (meal) as livestock feed ingredient (<i>second revision</i>)
1070 : 1992	Reagent grade water — Specification (<i>third revision</i>)	3593 : 1979	Specification for solvent extracted rice bran as livestock feed (<i>second revision</i>)
1162 : 1958	Specification for cane molasses		Specification for rice bran as livestock feed (<i>first revision</i>)
1374 : 2007	Poultry feeds — Specification (<i>fifth revision</i>)	3648 : 1975	Specification for fishmeal as livestock feed ingredient (<i>second revision</i>)
1712 : 1982	Specification for cottonseed oilcake as livestock feed ingredient (<i>second revision</i>)	4307 : 1983	Specification for meat meal as livestock feed ingredient (<i>first revision</i>)
1713 : 1986	Specification for decorticated groundnut oilcake as livestock feed ingredient (<i>second revision</i>)	5065 : 1986	Dicalcium phosphate, animal feed grade — Specification (<i>first revision</i>)
1932 : 1986	Specification for mustard and rapeseed oilcake as livestock feed ingredient (<i>second revision</i>)	5470 : 2002	Specification for solvent extracted nigerseed oilcake (meal) as livestock feed
1934 : 1982	Specification for sesamum oilcake as livestock feed ingredient (<i>first revision</i>)	5862 : 1970	Specification for solvent extracted undecorticated safflower oilcake as livestock feed ingredient (<i>first revision</i>)
1942 : 1968	Specification for bone-meal as livestock feed supplement (<i>first revision</i>)	6242 : 1985	Specification for blood meal as livestock feed
2151 : 1985	Specification for maize germ oilcake as livestock feed ingredient (<i>first revision</i>)	7060 : 1973	Methods of tests for animal feeds and feeding stuffs: Part 1 General methods
2152 : 1972	Specification for maize gluten as livestock feed ingredient (<i>first revision</i>)	7874 (Part 1) : 1975	Animal feeds and feeding stuffs — Methods of sampling for aflatoxin analysis
2154 : 1986	Specification for coconut oilcake as livestock feed ingredient (<i>second revision</i>)	13426 : 1992	Animal feeds and feeding stuffs — Determination of aflatoxin B ₁ content
3441 : 1982	Specification for solvent extracted groundnut oilcake (meal) as livestock feed ingredient (<i>first revision</i>)	13427 : 1992	Animal feeding stuffs — Determination of aflatoxin B ₁ content of mixed feeding stuffs — Method using high performance liquid chromatography
3591 : 1985	Specification for solvent-extracted coconut oilcake (meal) as livestock feed ingredient (<i>second revision</i>)	14718 : 1998	
3592 : 1985	Specification for solvent extracted		

ANNEX B

(Clause 4.1.1)

INGREDIENTS FOR CARP FEED

B-1 In the compounding of carp feed a variety of ingredients are used. This Annex gives a list of such ingredients.

B-1.1 Grain and Seeds

- a) Maize,

IS 16150 (Part 1) : 2014

- b) Barley,
- c) Bajra,
- d) Wheat,
- e) Jowar,
- f) Oats,
- g) Ragi, and
- h) Rice/broken rice.

B-1.2 Grain By-products

- a) Rice bran or solvent extracted rice bran and polishings (*see IS 3648 and IS 3593*),
- b) Wheat bran,
- c) Maize gluten and maize gluten feed (*see IS 2152*),
- d) Grain screenings, and
- e) Corn gluten.

B-1.3 Oil Cakes and Meals

- a) Copra cake, coconut oilcake (expeller-pressed or solvent extracted) (*see IS 2154 and IS 3591*);
- b) Cottonseed oilcake (decorticated) (expeller-pressed or solvent extracted) (*see IS 1712 and IS 3592*);
- c) Groundnut oilcake (expeller — pressed or solvent extracted) (*see IS 1713 and IS 3441*);
- d) Maize germ oilcake (*see IS 2151*);
- e) Mustard and rapeseed oilcake (*see IS 1932*);
- f) Neemseed kernel cake;
- g) Salseed meal, solvent extracted;
- h) Safflower (*Canthamus tinctorius*) oilcake (expeller-pressed or solvent extracted) (*see IS 6242*);
- j) Sesame (*Sesamum indicum orientale*) oilcake (expeller-pressed or solvent extracted) (*see IS 1934*);
- k) Soyabean meal (solvent extracted);

- m) Sunflower oilcake (decorticated or undecorticated);
- n) Niger seed oilcake (*see IS 5862*); and
- p) Sorgham meal.

B-1.4 Tubers and Roots

Tapioca flour

B-1.5 Animal Products

- a) Blood meal (*see IS 7060*),
- b) Fish meal (*see IS 4307*),
- c) Liver residue,
- d) Meat meal (*see IS 5065*) and meat scrap,
- e) Meat-cum-bone meal,
- f) Fish viscera meal,
- g) Chicken viscera meal,
- h) Silk worm pupae meal,
- j) Shrimp and shrimp head meal,
- k) Mollusc meat meal, and
- m) Bone meal (*see IS 1942*).

B-1.6 Minerals and Vitamins

- a) Dicalcium phosphate (*see IS 5470*),
- b) Common salt (*see IS 920*), and
- c) Vitamins (mineral stabilized).

B-1.7 Waste Material and Industrial By-products

- a) Brewers' grain,
- b) Dried yeast and yeast sludge, and
- c) Molasses (*see IS 1162*).

B-1.8 Other Ingredients

- a) Dunaliella,
- b) Antifungals,
- c) Peptiglycans,
- d) β -glucans, and
- e) Fuccoidan.

ANNEX C

[Table 1, Sl No. (vi)]

DETERMINATION OF GROSS ENERGY**C-1 GENERAL**

The bomb calorimeter provides a means of assessing the amount of energy (gross) made available during the catalytic degradation of combustible solids, liquids and gases in a pressurized oxygen atmosphere. Gross

energy is the amount of heat liberated when a substance is completely burnt to carbon dioxide and water. It is also known as heat of combustion.

C-1.1 Preparation of Sample Material

It is essential that the test sample is truly representative

IS 16150 (Part 1) : 2014

of the sample material. In general the sample material needs to be dried before combustion and here the sample characteristics will determine the method of drying to be used that is whether oven drying or vacuum drying at low temperature should be done before or after selection of a working sample. The drying process should not volatilize or destroy any of the combustible material. If complete dryness cannot be achieved easily without loss, preliminary tests should be made to determine the maximum water content at which this sample material can be ignited and completely burnt in the bomb. All material which have low bulk density and high surface area must be compacted.

C-2 PRINCIPLE

A known quantity of a sample is ignited electrically and burnt in excess of oxygen in the bomb. The maximum temperature rise is measured with the thermometers in a controlled system. By comparing this rise with that obtained when a sample of known calorific value is burnt, the calorific value of the sample material can be determined.

C-3 APPARATUS

C-3.1 Adiabatic Bomb Calorimeter

C-3.2 Pellet Press

C-3.3 Metallic Crucible

C-3.4 Hot Air Oven

C-3.5 Balance

C-3.6 Fuse Wire

C-3.7 Cotton Thread

C-3.8 Beaker

C-3.9 Burette

C-3.10 Pipette

C-3.11 Whatman Filter Paper No. 1

C-4 REAGENTS

C-4.1 Benzoic Acid (Calorimeter Grade, Gross Energy Content 6 318 cal/g)

C-4.2 Distilled Water

C-4.3 Oxygen Gas

C-4.4 Barium Hydroxide

C-4.5 Sodium Carbonate

C-4.6 Hydrochloric Acid

C-4.7 Methyl Red Indicator

C-4.8 Phenolphthalein Indicator

C-5 PROCEDURE

C-5.1 Determination of Bomb Equivalent

- a) Take about 0.35 g of benzoic acid and make a pellet with the help of a pellet press.
- b) Place the pellet in a pre-weighed metallic crucible. Weigh the pellet and crucible accurately.
- c) Put the bomb top on the stand. Thread a piece of fuse wire through the electrodes and tie a single strand of cotton to it. Keep the lengths of fuse wire and cotton thread constant in order to facilitate the calculation of calorific value.
- d) Swing the crucible into position, clamp the ring and arrange the ends of the cotton thread so that they are in contact with the sample.
- e) Pipette 1 ml of distilled water into the bomb.
- f) Place the electrode assembly into the bomb body ensuring that it fits correctly.
- g) Tighten the bomb closure ring by hand only.
- h) Fill the bomb to 25 atmospheric pressure with oxygen (oxygen must be free from hydrogen).
- j) Fill water into calorimetric vessel to submerge the bomb completely. The vessel and water should give a total mass of 3 kg. The quantity of water used is not critical but it must be constant for all tests to an accuracy of ± 0.5 kg.
- k) Place the bomb on three supports in the calorimeter vessel and check for the gas leakage that the bomb should not show any sign of gas leakage.
- m) Gently slide the top of the calorimeter console onto the bomb. Switch on the main and press down the bomb firing plug to contact the bomb.
- n) Adjust the initial temperature and press the fire switch.
- p) After 8 min read the temperature on main thermometer. Note final temperature when it stabilizes.

C-5.1.1 Calculation

$$\text{Bomb equivalent} = \frac{(6\ 318 \times M) + A}{T}$$

where

M = mass of benzoic acid (g);

A = correction factor for wire and thread [heat

IS 16150 (Part 1) : 2014

of combustion of thread and wire may be taken as 3 962 cal/g and 1 400 cal/g (or 2.3 cal/cm) respectively]; and

T = rise in temperature ($^{\circ}\text{C}$).

C-5.2 Gross Energy Estimation of Feed

Weight 0.5-1 g of finely ground representative sample and make a pellet with the help of pellet press. All the materials which have low bulk density and high surface area must be compacted to reduce their rate of combustion, or otherwise, it will lead to a false result due to loss of sample from the crucible, even more serious is the possibility that the combustion will be so rapid that it resembles an explosion. Weigh samples for dry matter determination at the time of pelletting. Put the pellet in a pre-weighed crucible and weigh again. Follow the steps (c) to (p) as described in C-5.1. Switch off the main switch. Remove the bomb from the vessel. Release pressure of the bomb using pressure release cap. Open the bomb and wash the electrodes and inside top and body of the bomb with distilled water. Collect these washing in a beaker for corrections for nitrogen and sulphur contents.

C-5.2.1 Calculation

$$\text{Gross energy (cal/g)} = \frac{(\text{Bomb equivalent} \times T) - A}{\text{Dry mass of sample (g)}}$$

where

T = rise in temperature; and

A = correction factors for wire, thread, nitrogen and sulphur.

C-5.3 Nitrogen and Sulphur Corrections

- Boil the washings (see C-5.2) collected in the beaker for 5 min.
- Cool and titrate against N/10 $\text{Ba}(\text{OH})_2$ solution using phenolphthalein indicator.
- Add 20 ml of N/10 Na_2CO_3 solution and boil again.
- Cool the contents and filter through Whatman filter paper No. 1 and give 2-3 washings with hot distilled water.
- Titrate the washings against N/10 HCl using methyl orange indicator.
- Heat liberated due to production of H_2SO_4 and HNO_3 can be calculated by using the following factors:

1 ml of N/10 $\text{Ba}(\text{OH})_2$ solution = 3.60 cal

1 ml of N/10 Na_2CO_3 solution = 1.43 cal

C-5.3.1 Calculations

Nitric acid correction (cal) = 1.43 ($B - C$)

Sulphuric acid correction (cal) = 3.60 [$A - (B - C)$]

where

A = amount of N/10 $\text{Ba}(\text{OH})_2$ solution used (ml);

B = amount of N/10 Na_2CO_3 solution added (ml); and

C = amount of N/10 HCl used (ml).

ANNEX D

[Table 1, Sl No. (vii)]

DETERMINATION OF FATTY ACIDS**D-1 LIPID EXTRACTION****D-1.1 Principle**

To ensure a complete and quantitative recovery of lipids, a solvent system composed of varying proportions of polar and non-polar components are used. Such mixture extracts total lipids more exhaustively and the extract is suitable for further lipid characterization. Commonly, the chloroform-methanol (2:1, v/v) solvent system provides an efficient medium for complete extraction of lipids from animal, plant, or bacterial tissues. The initial solvent system is binary and during the extraction process, it becomes a tertiary system consisting of chloroform, methanol and water

in various proportions, depending on the moisture content of the sample. Disturbing the equilibrium between chloroform and methanol separates the chloroform soluble fat.

D-1.2 Apparatus

D-1.2.1 High Speed Stirrer or Mortar Pestle

D-1.2.2 Buckner Flask and Buckner Funnel

D-1.2.3 Vacuum Pump

D-1.2.4 Filter Paper

D-1.2.5 Separating Funnel

D-1.2.6 Desiccators

D-1.2.7 Rotary Vacuum Evaporator**D-1.3 Reagents****D-1.3.1 Chloroform (Extraction Grade)****D-1.3.2 Methanol (Analytical Reagent Grade)****D-1.3.3 Chloroform-Methanol (2:1, v/v) Mixture****D-1.3.4 Butylated Hydroxytoluene (BHT)****D-1.3.5 Anhydrous Sodium Sulphate****D-1.4 Procedure**

Extract 20-50 g (depending upon the fat content) sample with about 15 volumes of chloroform-methanol mixture containing 0.01 percent BHT for 5 min, with the help of high speed stirrer or 5 min with mortar and pestle (few grams of silica or acid washed sand can be added at the time of grinding in mortar). Filter the homogenates using Buckner funnel with Whatman filter paper No.1 applying little vacuum. Measure the volume of the extract and add 20 percent water in a separating funnel, shake adequately and leave overnight. Filter the bottom layer of separating funnel containing chloroform with oil through anhydrous sodium sulphate. Transfer the chloroform phase to the evaporation flask and concentrate the lipid to a known volume, in a rotary vacuum evaporator, equipped with a heating bath and a vacuum pump. Take 1 ml of aliquot in pre-weighed test tube and dry. Cool the test tube in a desiccator and weigh.

D-1.5 Calculation

$$\text{Lipid (g/100 g)} = \frac{M_2 \times V_1}{V_2 \times M_1} \times 100$$

where

V_1 = total volume of extract,

V_2 = volume of extract taken for drying,

M_2 = mass of dried lipid, and

M_1 = mass of sample for fat extraction.

D-2 FATTY ACID ANALYSIS**D-2.1 Principle**

Saponification of fats liberates fatty acids from triglycerides. The fatty acids are derivatised into their corresponding fatty acid methyl esters by refluxing within sulphuric acid-methanol reagent and the fatty acid profile analyzed using gas liquid chromatography.

D-2.2 Apparatus**D-2.1.1 Gas Chromatograph****D-2.1.2 Hot Air Oven****D-2.1.3 Pasteur's Pipettes****D-2.1.4 Glass Vials****D-2.1.5 Digital Precision Balance.****D-2.3 Reagent****D-2.3.1 1 Percent Sulphuric Acid in Dry Methanol****D-2.3.2 5 Percent NaCl Solution****D-2.3.3 Hexane (HPLC Grade)****D-2.3.4 2 Percent Potassium Bicarbonate Solution****D-2.3.5 Anhydrous Sodium Sulphate****D-2.3.6 Dichloromethane****D-2.3.7 Standard Fatty Acid Methyl Esters****D-2.4 Procedure****D-2.4.1 Extraction of Fatty Acids and Methyl Ester Preparation**

The lipid sample (up to 50 mg) is dissolved in hexane (1 ml) in a test tube and 1 percent sulphuric acid in methanol (2 ml) is added. The mixture is left overnight in a stoppered tube at 50°C (or is refluxed for 2 h at 70°C), then 5 ml of 5 percent sodium chloride solution is added and the required esters are extracted with hexane (2 × 5 ml), using Pasteur's pipettes to separate the layers. The hexane layer is washed with 4 ml of 2 percent potassium bicarbonate and dried over anhydrous sodium sulphate. The solution is filtered and the solvent removed under a rotary vacuum evaporator and the residue is rinsed with 1 ml dichloromethane and collected in glass vial. Fatty acid methyl esters are separated by a gas chromatograph equipped with a flame-ionization detector on a DB-25 capillary column (20 m × 0.10 mm I.D., 0.10 µm).

D-2.4.2 Fatty Acids (Including 18:2n-6 Poly Unsaturated Fatty Acids) Separation Conditions

Hydrogen gas is used as carrier gas. The flow rate of gas is 40 ml/min. The initial injection temperature is maintained at 35°C with a holding period of 0.5 min. Thereafter, the column temperature is increased at 25°C/min till the temperature reaches 195°C, at 3°C/min till 205°C, at 8°C/min till 205-230°C and finally 1 min to reach 230°C. One µl of sample is injected into the gas chromatograph. Poly unsaturated fatty acids (18:2n-6) are quantified by comparing their peaks with the relevant peak areas of the corresponding standard fatty acids where each fatty acid is then expressed as a percentage of the total fatty acids quantified.

D-2.5 Calculation

$$\text{Fatty acid (\mu g/l)} = \frac{A \times B \times C \times D}{E \times F \times G}$$

IS 16150 (Part 1) : 2014

where

A = mg standard;
B = peak height of sample (mm) or area count;
C = extract volume (μl);

D = dilution factor;
E = peak height of standard (mm) or area count;
F = volume of extract injected (μl); and
G = volume of sample extracted (g).

ANNEX E

(Clause 4.5.2)

DETERMINATION OF WATER STABILITY OF CARP FEED PELLETS

E-1 PRINCIPLE

Water stability of dry carp feed pellets is determined by the loss in mass of pellets kept in water for a specified time interval. The loss in mass of pellets indicates the stability, higher the loss poorer the stability.

E-2 APPARATUS

E-2.1 Oven

E-2.2 Nylon Mesh

E-2.3 Sieve (2.4 mm)

E-2.4 Balance

E-2.5 Glass Beaker (1 litre)

E-2.6 Stop Watch

E-3 PROCEDURE

Wash cone shaped pouches made of nylon mesh (1 mm mesh size) thoroughly and dry at 70°C to constant mass in an oven. Take about 2 g of feed pellets in each pouch and record exact initial mass. Take 5-6 such pouches for each sample. Place the pouches with feed pellets at the bottom of 1 litre beaker containing 1 litre distilled water. Record water temperature. After prescribed time, slowly take out pouches with pellets out of the water. Examine the pellets for their physical shape. Dry the pouches with pellets at 70°C to constant mass. Difference in the initial mass and final mass of the pellets gives loss in mass at 70°C.

E-4 CALCULATION

Water stability is calculated using the following formula:

$$\text{Percent water stability} = \frac{\text{Final mass (g)} \times \text{Percent dry matter}}{\text{Initial mass (g)} \times \text{Percent dry matter}} \times 100$$

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc No.: FAD 12 (2337).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
 Telephones : 2323 0131, 2323 3375, 2323 9402 Website: www.bis.org.in

Regional Offices:

	Telephones
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	$\begin{cases} 2323 7617 \\ 2323 3841 \end{cases}$

Eastern : 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700054	$\begin{cases} 2337 8499, 2337 8561 \\ 2337 8626, 2337 9120 \end{cases}$
--	--

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022	$\begin{cases} 260 3843 \\ 260 9285 \end{cases}$
--	--

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113	$\begin{cases} 2254 1216, 2254 1442 \\ 2254 2519, 2254 2315 \end{cases}$
---	--

Western : Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	$\begin{cases} 2832 9295, 2832 7858 \\ 2832 7891, 2832 7892 \end{cases}$
---	--

Branches: AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. DEHRADUN.
 FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. KOCHI.
 LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAJKOT. VISAKHAPATNAM.

IS 16150 (Part 2) : 2014

Indian Standard
FISH FEED — SPECIFICATION
PART 2 CATFISH FEED

1 SCOPE

This standard (Part 2) prescribes the requirements and the methods of sampling and test for catfish (*Clarias batrachus*) feeds.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed in Annex A.

3 TYPES

Catfish feed shall be of the following four types:

- a) *Catfish Larval Feed (CLF)* — feed to be fed to catfish larvae up to 15th day/20 mm length.
- b) *Catfish Fry Feed (CFF)* — feed to be fed to catfish from 16-90 days/21-70 mm length.
- c) *Catfish Grow-out Feed (CGF)* — feed to be fed to catfish from 4th month to harvesting.
- d) *Catfish Brood Feed (CBF)* — feed to be fed to brood catfish before 4 months of onset of breeding.

4 REQUIREMENTS

4.1 Description

The catfish feed shall be free from rancidity, adulterants, moulds and insect infestation.

4.1.1 Ingredients

The ingredients listed in Annex B shall only be used for manufacturing catfish feed.

4.2 The catfish feed shall also conform to the requirements given in Table 1.

4.3 Antibiotics and Additives

If antibiotics or other additives are incorporated into the catfish feed, these shall be declared on the label. The use of any of the following antibiotics and other Pharmacologically Active Substances shall be prohibited in any unit manufacturing catfish feed:

- a) All nitrofurans including, furaltadone, furazolidone, furylfuramide, nifuratel, nifuroxime, nifurprazine, nitrofurnatoxin, nitrofurazone;
- b) Chloramphenicol;
- c) Neomycin;
- d) Nalidixic acid;
- e) Sulphamethoxazole;
- f) Aristolochia spp. and preparations thereof;
- g) Chloroform;
- h) Chloropromazine;
- j) Cholchicine;
- k) Dapsone;
- m) Dimetridazole;
- n) Metronidazole;
- p) Ronidazole;
- q) Ipronidazole;
- r) Other nitromidazoles;

Table 1 Requirements for Catfish Feed
(Clauses 4.2 and 7.1)

Sl No.	Characteristics	Requirements				Method of Test, Ref to
		Catfish Larval Feed (3)	Catfish Fry Feed (4)	Catfish Grow-out Feed (5)	Catfish Brood Feed (6)	
(1)	(2)					(7)
i)	Moisture, percent by mass, <i>Max</i>	10	10	10	10	4 of IS 7874 (Part 1)
ii)	Crude protein ($N \times 6.25$), percent by mass, <i>Min</i>	40	35	35	30	5 of IS 7874 (Part 1)
iii)	Crude fat, percent by mass, <i>Min</i>	10	8	6	6	7 of IS 7874 (Part 1)
iv)	Crude fibre, percent by mass, <i>Max</i>	4	6	6	6	8 of IS 7874 (Part 1)
v)	Acid insoluble ash, percent by mass, <i>Max</i>	2.5	3	3	3	10 of IS 7874 (Part 1)
vi)	Gross energy, kcal/kg, <i>Min</i>	4 000	3 500	3 000	3 000	Annex C

NOTE — The requirements specified for characteristics (ii) to (vi) are on moisture-free basis.

IS 16150 (Part 2) : 2014

- s) Clenbuterol;
- t) Diethylstibestrol (DES);
- u) Sulfanoamide drugs (except approved sulfadimethoxine, sulfabromomethazine and sulfaethoxypyridazine);
- v) Fluoroquinolones; and
- w) Glycopeptides.

4.4 Aflatoxin B₁ content of the catfish feed shall not exceed 0.01 mg/kg at the time of manufacture. Aflatoxin B₁ shall be tested by the manufacturer in accordance with the test method prescribed in IS 13427 or IS 14718* and declared on the label. Sampling of catfish feed for estimation of aflatoxin B₁ content shall be done in accordance with IS 13426.

NOTE — In case of dispute, the method indicated by ** in 4.4 shall be the referee method.

4.5 Physical Characteristics**4.5.1 Feed Form and Size**

4.5.1.1 Catfish larval feed shall be in the form of powder or granules of size less than or equal to 100 µm.

4.5.1.2 Catfish fry feed shall be in the form of granules or crumbles of size 0.25 mm to 1 mm.

4.5.1.3 Catfish grow-out feed shall be in the form of crumbles or pellets of size 1 mm to 2 mm.

4.5.1.4 Catfish brood feed shall be in the form of pellets of size 2 mm.

4.5.2 Water Stability of Pellets

The feed pellets should be stable without disintegration in water for 2 h minimum. The water stability shall be as follows when tested as per Annex D.

Type of Catfish Feed	Water Stability
Catfish larval feed	not less than 90 percent after 30 min
Catfish fry feed	not less than 90 percent after 45 min
Catfish grow-out feed	not less than 90 percent after 45 min
Catfish brood feed	not less than 90 percent after 60 min

5 PACKING AND MARKING**5.1 Packing**

The material shall be packed in clean, dry and sound, plain or polyethylene-lined jute or laminated paper bags. The mouth of each bag shall be either machine stitched or rolled over and hand-stitched.

5.2 Marking

5.2.1 Each bag should be suitably marked so as to give the following information legibly:

- a) Name of the material and brand name, if any;
- b) Type of the fish feed;
- c) Name and address of the manufacturer;
- d) Net quantity when packed;
- e) Batch or Code number;
- f) Date of manufacture; and
- g) Any other markings required under the *Legal Metrology (Packaged Commodities) Rules, 2011*.

5.2.2 In addition to the information listed in 5.2.1, each bag shall have a label or tag attached to it or contain a leaflet giving the following information:

- a) Type of the fish feed;
- b) Name and quantity of the antibiotic or additives added, if any;
- c) Moisture content;
- d) Crude protein content;
- e) Crude fibre content;
- f) Crude fat content;
- g) Aflatoxin B₁ content;
- h) Gross energy; and
- j) Direction for use.

5.3 BIS Certification Marking

The product may also be marked with the Standard Mark.

5.3.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations framed thereunder. The details of the conditions under which the licence for use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

Representative samples of the material shall be drawn according to the method prescribed in IS 1374.

7 TESTS

7.1 Tests shall be carried out as prescribed in 4.4, 4.5.2 and col 7 of Table 1.

8 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities, which affect the result of analysis.

IS 16150 (Part 2) : 2014

ANNEX A (Clause 2)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
920 : 1972	Specification for common salt and cattle licks for animal consumption (<i>first revision</i>)		decorticated cottonseed oilcake (meal) as livestock feed ingredient (<i>second revision</i>)
1070 : 1992	Reagent grade water — Specification (<i>third revision</i>)	3593 : 1979	Specification for solvent extracted rice bran as livestock feed (<i>second revision</i>)
1162 : 1958	Specification for cane molasses	3648 : 1975	Specification for rice bran as livestock feed (<i>first revision</i>)
1374 : 2007	Poultry feeds — Specification (<i>fifth revision</i>)	4307 : 1983	Specification for fishmeal as livestock feed ingredient (<i>second revision</i>)
1712 : 1982	Specification for cottonseed oilcake as livestock feed ingredient (<i>second revision</i>)	5065 : 1986	Specification for meat meal as livestock feed ingredient (<i>first revision</i>)
1713 : 1986	Specification for decorticated groundnut oilcake as livestock feed ingredient (<i>second revision</i>)	5470 : 2002	Dicalcium phosphate, animal feed grade — Specification (<i>first revision</i>)
1932 : 1986	Specification for mustard and rapeseed oilcake as livestock feed ingredient (<i>second revision</i>)	5862 : 1970	Specification for solvent extracted nigerseed oilcake (meal) as livestock feed
1934 : 1982	Specification for sesamum oilcake as livestock feed ingredient (<i>first revision</i>)	6242 : 1985	Specification for solvent extracted undecorticated safflower oilcake as livestock feed ingredient (<i>first revision</i>)
1942 : 1968	Specification for bone-meal as livestock feed supplement (<i>first revision</i>)	7060 : 1973	Specification for blood meal as livestock feed
2151 : 1985	Specification for maize germ oilcake as livestock feed ingredient (<i>first revision</i>)	7874 (Part 1) : 1975	Methods of tests for animal feeds and feeding stuffs: Part 1 General methods
2152 : 1972	Specification for maize gluten as livestock feed ingredient (<i>first revision</i>)	13426 : 1992	Animal feeds and feeding stuffs — Methods of sampling for aflatoxin analysis
2154 : 1986	Specification for coconut oilcake as livestock feed ingredient (<i>second revision</i>)	13427 : 1992	Animal feeds and feeding stuffs — Determination of aflatoxin B ₁ content
3441 : 1982	Specification for solvent extracted groundnut oilcake (meal) as livestock feed ingredient (<i>first revision</i>)	14718 : 1998	Animal feeding stuffs — Determination of aflatoxin B ₁ content of mixed feeding stuffs — Method using high performance liquid chromatography
3591 : 1985	Specification for solvent extracted coconut oilcake (meal) as livestock feed ingredient (<i>second revision</i>)		
3592 : 1985	Specification for solvent extracted		

ANNEX B (Clause 4.1.1)

INGREDIENTS FOR CATFISH FEED

B-1 In the compounding of catfish feed a variety of ingredients are used. This Annex gives a list of such ingredients.

B-1.1 Grain and Seeds

- a) Maize,

IS 16150 (Part 2) : 2014

- b) Barley,
- c) Bajra,
- d) Wheat,
- e) Jowar,
- f) Oats,
- g) Ragi, and
- h) Rice/broken rice.
- m) Sunflower oilcake (decorticated or undecorticated);
- n) Niger seed oilcake (*see IS 5862*); and
- p) Sorgham meal.

B-1.2 Grain By-products

- a) Rice bran or solvent extracted rice bran and polishings (*see IS 3648 and IS 3593*),
- b) Wheat bran,
- c) Maize gluten and maize gluten feed (*see IS 2152*),
- d) Grain sieving, and
- e) Corn gluten.

B-1.3 Oil Cakes and Meals

- a) Copra cake, coconut oilcake (expeller-pressed or solvent extracted) (*see IS 2154 and IS 3591*);
- b) Cottonseed oilcake (decorticated) (expeller-pressed or solvent extracted) (*see IS 1712 and IS 3592*);
- c) Groundnut oilcake (expeller-pressed or solvent extracted) (*see IS 1713 and IS 3441*);
- d) Maize germ oilcake (*see IS 2151*);
- e) Mustard and rapeseed oilcake (*see IS 1932*);
- f) Neemseed kernel cake;
- g) Salseed meal, solvent extracted;
- h) Safflower (*Canthamus tinctorius*) oilcake (expeller-pressed or solvent extracted) (*see IS 6242*)
- j) Sesame (*Sesamum indicum orientale*) oilcake (expeller-pressed or solvent extracted) (*see IS 1934*);
- k) Soyabean meal (solvent extracted);

B-1.4 Tubers and Roots

Tapioca flour

B-1.5 Animal Products

- a) Blood meal (*see IS 7060*),
- b) Fish meal (*see IS 4307*),
- c) Liver residue,
- d) Meat meal (*see IS 5065*) and meat scrap,
- e) Meat-cum-bone meal,
- f) Fish viscera meal,
- g) Chicken viscera meal,
- h) Silk worm pupae meal,
- j) Shrimp and shrimp head meal,
- k) Mollusc meat meal, and
- m) Bone meal (*see IS 1942*).

B-1.6 Minerals and Vitamins

- a) Dicalcium phosphate (*see IS 5470*),
- b) Common salt (*see IS 920*), and
- c) Vitamins (mineral stabilised).

B-1.7 Waste Material and Industrial By-products

- a) Brewers' grain,
- b) Dried yeast and yeast sludge, and
- c) Molasses (*see IS 1162*).

B-1.8 Other Ingredients

- a) Dunaliella,
- b) Antifungals,
- c) Peptiglycans,
- d) β -glucans, and
- e) Fuccoidan.

ANNEX C

[Table 1, Sl No. (vi)]

DETERMINATION OF GROSS ENERGY**C-1 GENERAL**

The bomb calorimeter provides a means of assessing the amount of energy (gross) made available during the catalytic degradation of combustible solids, liquids and gases in a pressurized oxygen atmosphere. Gross energy is the amount of heat liberated when a substance is completely burnt to carbon dioxide and water. It is also known as heat of combustion.

C-1.1 Preparation of Sample Material

It is essential that the test sample is truly representative of the sample material. In general the sample material needs to be dried before combustion and here the sample characteristics will determine the method of drying to be used that is whether oven drying or vacuum drying at low temperature should be done before or after selection of a working sample. The drying process

IS 16150 (Part 2) : 2014

should not volatilize or destroy any of the combustible material. If complete dryness cannot be achieved easily without loss, preliminary tests should be made to determine the maximum water content at which this sample material can be ignited and completely burnt in the bomb. All material which have low bulk density and high surface area must be compacted.

C-2 PRINCIPLE

A known quantity of a sample is ignited electrically and burnt in excess of oxygen in the bomb. The maximum temperature rise is measured with the thermometers in a controlled system. By comparing this rise with that obtained when a sample of known calorific value is burnt, the calorific value of the sample material can be determined.

C-3 APPARATUS

C-3.1 Adiabatic Bomb Calorimeter

C-3.2 Pellet Press

C-3.3 Metallic Crucible

C-3.4 Hot Air Oven

C-3.5 Balance

C-3.6 Fuse Wire

C-3.7 Cotton Thread

C-3.8 Beaker

C-3.9 Burette

C-3.10 Pipette

C-3.11 Whatman Filter Paper No. 1

C-4 REAGENTS

C-4.1 Benzoic Acid (Calorimeter Grade, Gross Energy Content 6 318 cal/g)

C-4.2 Distilled Water

C-4.3 Oxygen Gas

C-4.4 Barium Hydroxide

C-4.5 Sodium Carbonate

C-4.6 Hydrochloric Acid

C-4.7 Methyl Red Indicator

C-4.8 Phenolphthalein Indicator

C-5 PROCEDURE

C-5.1 Determination of Bomb Equivalent

- a) Take about 0.35 g of benzoic acid and make a pellet with the help of a pellet press.
- b) Place the pellet in a pre-weighed metallic crucible. Weigh the pellet and crucible accurately.
- c) Put the bomb top on the stand. Thread a piece of fuse wire through the electrodes and tie a single strand of cotton to it. Keep the lengths of fuse wire and cotton thread constant in order to facilitate the calculation of calorific value.
- d) Swing the crucible into position, clamp the ring and arrange the ends of the cotton thread so that they are in contact with the sample.
- e) Pipette 1 ml of distilled water into the bomb.
- f) Place the electrode assembly into the bomb body ensuring that it fits correctly.
- g) Tighten the bomb closure ring by hand only.
- h) Fill the bomb to 25 atmospheric pressure with oxygen (oxygen must be free from hydrogen).
- j) Fill water into calorimetric vessel to submerge the bomb completely. The vessel and water should give a total mass of 3 kg. The quantity of water used is not critical but it must be constant for all tests to an accuracy of ± 0.5 kg.
- k) Place the bomb on three supports in the calorimeter vessel and check for the gas leakage that the bomb should not show any sign of gas leakage.
- m) Gently slide the top of the calorimeter console onto the bomb. Switch on the main and press down the bomb firing plug to contact the bomb.
- n) Adjust the initial temperature and press the fire switch.
- p) After 8 min read the temperature on main thermometer. Note final temperature when it stabilizes.

C-5.1.1 Calculation

$$\text{Bomb equivalent} = \frac{(6\ 318 \times M) + A}{T}$$

where

M = mass of benzoic acid (g);

A = correction factor for wire and thread [heat of combustion of thread and wire may be taken as 3 962 cal/g and 1 400 cal/g (or 2.3 cal/cm) respectively]; and

T = rise in temperature ($^{\circ}\text{C}$).

IS 16150 (Part 2) : 2014**C-5.2 Gross Energy Estimation of Feed**

Weight 0.5-1 g of finely ground representative sample and make a pellet with the help of pellet press. All the materials which have low bulk density and high surface area must be compacted to reduce their rate of combustion, or otherwise, it will lead to a false result due to loss of sample from the crucible, even more serious is the possibility that the combustion will be so rapid that it resembles an explosion. Weigh samples for dry matter determination at the time of pelleting. Put the pellet in a pre-weighed crucible and weigh again. Follow the steps (c) to (p) as described in C-5.1. Switch off the main switch. Remove the bomb from the vessel. Release pressure of the bomb using pressure release cap. Open the bomb and wash the electrodes and inside top and body of the bomb with distilled water. Collect these washing in a beaker for corrections for nitrogen and sulphur contents.

C-5.2.1 Calculation

$$\text{Gross energy (cal/g)} = \frac{(\text{Bomb equivalent} \times T) - A}{\text{Dry mass of sample (g)}}$$

where

T = rise in temperature; and

A = correction factors for wire, thread, nitrogen and sulphur.

C-5.3 Nitrogen and Sulphur Corrections

- a) Boil the washings (see C-5.2) collected in the beaker for 5 min.
- b) Cool and titrate against N/10 Ba(OH)_2 solution using phenolphthalein indicator.
- c) Add 20 ml of N/10 Na_2CO_3 solution and boil again.
- d) Cool the contents and filter through Whatman filter paper No. 1 and give 2-3 washings with hot distilled water.
- e) Titrate the washings against N/10 HCl using methyl orange indicator.
- f) Heat liberated due to production of H_2SO_4 and HNO_3 can be calculated by using the following factors:

1 ml of N/10 Ba(OH)_2 solution = 3.60 cal

1 ml of N/10 Na_2CO_3 solution = 1.43 cal

C-5.3.1 Calculations

$$\text{Nitric acid correction (cal)} = 1.43 (B - C)$$

$$\text{Sulphuric acid correction (cal)} = 3.60 [A - (B - C)]$$

where

A = amount of N/10 Ba(OH)_2 solution used (ml);

B = amount of N/10 Na_2CO_3 solution added (ml); and

C = amount of N/10 HCl used (ml).

ANNEX D (Clause 4.5.2)

DETERMINATION OF WATER STABILITY OF CATFISH FEED PELLETS

D-1 PRINCIPLE

Water stability of dry catfish feed pellets is determined by the loss in mass of pellets kept in water for a specified time interval. The loss in mass of pellets indicates the stability, higher the loss poorer the stability.

D-2 APPARATUS**D-2.1 Oven****D-2.2 Nylon Mesh****D-2.3 Sieve (2.4 mm)****D-2.4 Balance****D-2.5 Glass Beaker (1 litre)****D-2.6 Stop Watch****D-3 PROCEDURE**

Wash cone shaped pouches made of nylon mesh (1 mm mesh size) thoroughly and dry at 70°C to constant mass in an oven. Take about 2 g of feed pellets in each pouch and record exact initial mass. Take 5-6 such pouches for each sample. Place the pouches with feed pellets at the bottom of 1 litre beaker containing 1 litre distilled water. Record water temperature. After prescribed time,

IS 16150 (Part 2) : 2014

slowly take out pouches with pellets out of the water. Examine the pellets for their physical shape. Dry the pouches with pellets at 70°C to constant mass. Difference in the initial mass and final mass of the pellets gives loss in mass at 70°C.

D-4 CALCULATION

Water stability is calculated using the following formula:

$$\text{Percent water stability} = \frac{\text{Final mass (g)} \times \text{Percent dry matter}}{\text{Initial mass (g)} \times \text{Percent dry matter}} \times 100$$

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc No.: FAD 12 (2338).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
 Telephones : 2323 0131, 2323 3375, 2323 9402 Website: www.bis.org.in

Regional Offices:

Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	<i>Telephones</i> $\left\{ \begin{array}{l} 2323 7617 \\ 2323 3841 \end{array} \right.$
---------	---	--

Eastern	: 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700054	<i>Telephones</i> $\left\{ \begin{array}{l} 2337 8499, 2337 8561 \\ 2337 8626, 2337 9120 \end{array} \right.$
---------	--	--

Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	<i>Telephones</i> $\left\{ \begin{array}{l} 260 3843 \\ 260 9285 \end{array} \right.$
----------	---	--

Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600113	<i>Telephones</i> $\left\{ \begin{array}{l} 2254 1216, 2254 1442 \\ 2254 2519, 2254 2315 \end{array} \right.$
----------	--	--

Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	<i>Telephones</i> $\left\{ \begin{array}{l} 2832 9295, 2832 7858 \\ 2832 7891, 2832 7892 \end{array} \right.$
---------	---	--

Branches:	AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. DEHRADUN. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. KOCHI. LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAJKOT. VISAKHAPATNAM.
------------------	--

IS 16150 (Part 3) : 2014

Indian Standard
FISH FEED — SPECIFICATION

PART 3 MARINE SHRIMP FEED**1 SCOPE**

This standard (Part 3) prescribes the requirements and the methods of sampling and test for marine shrimp (*Penaeus monodon* and *Litopenaeus vannamei*) feeds for their grow-out culture.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed in Annex A.

3 TYPES

The marine shrimp feed shall be of the following types:

- a) *Starter Grade* — feed to be fed to post larvae of penaeid shrimp in grow-out ponds until they attain a mass of about 7.0 g. There may

be sub-grades such as Starter - I, Starter - II, Starter - III etc.

- b) *Grower Grade* — feed to be fed to growing shrimp of about 7.0 g until they attain a mass of about 20 g.
- c) *Finisher Grade* — feed to be fed to growing shrimp of above 20 g mass.

4 REQUIREMENTS**4.1 Description**

The marine shrimp feed shall be fresh, free from rancidity, musty and objectionable odour, adulterants, moulds and insect infestation.

4.1.1 Ingredients

The ingredients listed in Annex B shall only be used for manufacturing marine shrimp feed.

4.2 *Penaeus monodon* feed shall also conform to the requirements given in Table 1 and *Litopenaeus vannamei* feed shall also conform to the requirements given in Table 2.

Table 1 Requirements for *Penaeus monodon* Feed
(Clauses 4.2 and 7.1)

Sl No.	Characteristics	Requirements			Method of Test, Ref to
		Starter (3)	Grower (4)	Finisher (5)	
(1)	(2)				(6)
i)	Moisture, percent by mass, <i>Max</i>	12.0	12.0	12.0	4 of IS 7874 (Part 1)
ii)	Crude Protein (N × 6.25), percent by mass, <i>Min</i>	35.0	32.0	30.0	5 of IS 7874 (Part 1)
iii)	Crude fat, percent by mass, <i>Min</i>	5.0	5.0	5.0	7 of IS 7874 (Part 1)
iv)	Crude fibre, percent by mass, <i>Max</i>	3.0	4.0	5.0	8 of IS 7874 (Part 1)
v)	Acid insoluble ash, percent by mass, <i>Max</i>	4.0	5.0	5.0	10 of IS 7874 (Part 1)
vi)	Gross energy, kcal/kg, <i>Min</i>	3 200	3 200	3 000	Annex C
vii)	Phosphorus, percent by mass, <i>Max</i>	1	1	1	6 of IS 7874 (Part 2)

NOTE — The requirements specified for characteristics (ii) to (vii) are on moisture-free basis.

Table 2 Requirements for *Litopenaeus vannamei* Feed
(Clauses 4.2 and 7.1)

Sl No.	Characteristics	Requirements			Method of Test, Ref to
		Starter (3)	Grower (4)	Finisher (5)	
(1)	(2)				(6)
i)	Moisture, percent by mass, <i>Max</i>	12.0	12.0	12.0	4 of IS 7874 (Part 1)
ii)	Crude Protein (N × 6.25), percent by mass, <i>Min</i>	35.0	30.0	25.0	5 of IS 7874 (Part 1)
iii)	Crude fat, percent by mass, <i>Min</i>	5.0	5.0	5.0	7 of IS 7874 (Part 1)
iv)	Crude fibre, percent by mass, <i>Max</i>	3.0	4.0	5.0	8 of IS 7874 (Part 1)
v)	Acid insoluble ash, percent by mass, <i>Max</i>	4.0	5.0	5.0	10 of IS 7874 (Part 1)
vi)	Gross energy, kcal/kg, <i>Min</i>	3 000	3 000	2 800	Annex C

NOTE — The requirements specified for characteristics (ii) to (vi) are on moisture-free basis.

IS 16150 (Part 3) : 2014**4.3 Antibiotics and Additives**

If antibiotics or other additives are incorporated into the marine shrimp feed, these shall be declared on the label. The use of any of the following antibiotics and other Pharmacologically Active Substances shall be prohibited in any unit manufacturing marine shrimp feed:

- a) All nitrofurans including, furaltadone, furazolidone, furylfuramide, nifuratel, nifuroxime, nifurprazine, nitrofurnatoin, nitrofurazone;
- b) Chloramphenicol;
- c) Neomycin;
- d) Nalidixic acid;
- e) Sulphamethoxazole;
- f) Aristolochia spp. and preparations thereof;
- g) Chloroform;
- h) Chloropromazine;
- j) Cholchicine;
- k) Dapsone;
- m) Dimetridazole;
- n) Metronidazole;
- p) Ronidazole;
- q) Ipronidazole;
- r) Other nitromidazoles;
- s) Clenbuterol;
- t) Diethylstibestrol (DES);
- u) Sulfanoamide drugs (except approved sulfadimethoxine, sulfabromomethazine and sulfaethoxypyridazine);
- v) Fluoroquinolones; and
- w) Glycopeptides.

4.4 Aflatoxin B₁ content of the marine shrimp feed shall not exceed 0.05 mg/kg at the time of manufacture. Aflatoxin B₁ shall be tested by the manufacturer in accordance with the test method prescribed in IS 13427 or IS 14718* and declared on the label. Sampling of the marine shrimp feed for estimation of aflatoxin B₁ content shall be done in accordance with IS 13426.

NOTE — In case of dispute, the method indicated by ** in 4.4 shall be the referee method.

4.5 Physical Characteristics**4.5.1 Feed Form and Size**

4.5.1.1 Starter grade feed shall be in the form of granules or pellets of 0.4 mm to 2.0 mm length and 2 mm diameter.

4.5.1.2 Grower grade and finisher grade feed shall be in the form of pellets of 1.8 mm to 2.3 mm diameter.

4.5.2 Water Stability of Pellets

The feed pellets should be stable without disintegration in water for 2 h minimum. The water stability shall not be less than 90 percent after 1 h when tested as per Annex D.

5 PACKING AND MARKING**5.1 Packing**

The material shall be packed in clean, dry and polythene lined bags (jute or laminated paper bags). The mouth of each bag shall be machine stitched or rolled over and hand stitched.

5.2 Marking

5.2.1 Each bag should be suitably marked so as to give the following information legibly:

- a) Name of the material and brand name, if any;
- b) Type of the shrimp feed along with grade, sub-grade;
- c) Name and address of the manufacturer;
- d) Net quantity when packed;
- e) Batch or Code number;
- f) Date of manufacture; and
- g) Any other markings required under the *Legal Metrology (Packaged Commodities) Rules, 2011*.

5.2.2 In addition to the information listed in 5.2.1, each bag shall have a label or tag attached to it or contain a leaflet giving the following information:

- a) Type of marine shrimp feed;
- b) Name and quantity of the antibiotic or additives added, if any;
- c) Moisture content;
- d) Crude protein content;
- e) Crude fibre content;
- f) Crude fat content;
- g) Gross energy;
- h) Aflatoxin B₁ content; and
- j) Direction for use.

5.3 BIS Certification Marking

The product may also be marked with the Standard Mark.

5.3.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations framed thereunder. The details of the conditions under which the licence for use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

IS 16150 (Part 3) : 2014

6 SAMPLING

Representative samples of the material shall be drawn according to the method prescribed in IS 1374.

7 TESTS

7.1 Tests shall be carried out as prescribed in **4.4, 4.5.2** and col 6 of Table 1 and Table 2.

8 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — ‘Pure chemicals’ shall mean chemicals that do not contain impurities, which affect the result of analysis.

ANNEX A*(Clause 2)***LIST OF REFERRED INDIAN STANDARDS**

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
920 : 1972	Specification for common salt and cattle licks for animal consumption (<i>first revision</i>)	3592 : 1985	Specification for solvent extracted decorticated cottonseed oilcake (meal) as livestock feed ingredient (<i>second revision</i>)
1070 : 1992	Reagent grade water — Specification (<i>third revision</i>)	3648 : 1975	Specification for rice bran as livestock feed (<i>first revision</i>)
1162 : 1958	Specification for cane molasses	4307 : 1983	Specification for fishmeal as livestock feed ingredient (<i>second revision</i>)
1374 : 2007	Poultry feeds — Specification (<i>fifth revision</i>)	5065 : 1986	Specification for meat meal as livestock feed ingredient (<i>first revision</i>)
1712 : 1982	Specification for cottonseed oilcake as livestock feed ingredient (<i>second revision</i>)	5470 : 2002	Dicalcium phosphate, animal feed grade — Specification (<i>first revision</i>)
1713 : 1986	Specification for decorticated groundnut oilcake as livestock feed ingredient (<i>second revision</i>)	7060 : 1973	Specification for blood meal as livestock feed
1932 : 1986	Specification for mustard and rapeseed oilcake as livestock feed ingredient (<i>second revision</i>)	7874	Methods of tests for animal feeds and feeding stuffs :
1934 : 1982	Specification for sesamum oilcake as livestock feed ingredient (<i>first revision</i>)	(Part 1) : 1975	General methods
1942 : 1968	Specification for bone-meal as livestock feed supplement (<i>first revision</i>)	(Part 2) : 1975	Minerals and trace elements
2154 : 1986	Specification for coconut oilcake as livestock feed ingredient (<i>second revision</i>)	13426 : 1992	Animal feeds and feeding stuffs — Methods of sampling for aflatoxin analysis
3441 : 1982	Specification for solvent extracted groundnut oilcake (meal) as livestock feed ingredient (<i>first revision</i>)	13427 : 1992	Animal feeds and feeding stuffs — Determination of aflatoxin B ₁ content
3591 : 1985	Specification for solvent-extracted coconut oilcake (meal) as livestock feed ingredient (<i>second revision</i>)	14718 : 1998	Animal feeding stuffs — Determination of aflatoxin B ₁ content of mixed feeding stuffs — Method using high performance liquid chromatography

IS 16150 (Part 3) : 2014

ANNEX B
(Clause 4.1.1)

INGREDIENTS FOR MARINE SHRIMP FEED

B-1 In the compounding of marine shrimp feed a variety of ingredients are used. This Annex gives a list of such ingredients.

B-1.1 Ingredients of Animal Origin

- a) Fishmeal (*see IS 4307*) and all other fish products;
- b) All crustacean meals;
- c) Squid meal and all other squid products;
- d) Molluscan meal (clam, mussel, etc);
- e) Silkworm pupae;
- f) Fish oil;
- g) Squid oil;
- h) Squid liver oil;
- j) Meat meal (*see IS 5065*);
- k) Bone meal (*see IS 1942*); and
- m) Blood meal (*see IS 7060*).

B-1.2 Ingredients of Plant Origin

- a) Soybean cake (meal),
- b) Groundnut oilcake (expeller-pressed or solvent extracted) (*see IS 1713 and IS 3441*),
- c) Sesame (*Sesamum indicum orientale*) oilcake (expeller-pressed or solvent extracted) (*see IS 1934*),
- d) Cottonseed oilcake (decorticated) (expeller-pressed or solvent extracted) (*see IS 1712 and IS 3592*),
- e) Sunflower oilcake (decorticated or undecorticated),
- f) Copra cake, coconut oilcake (expeller-pressed or solvent extracted) (*see IS 2154 and IS 3591*),
- g) Mustard oilcake (*see IS 1932*),
- h) Wheat and wheat products,

- j) Rice its products/broken rice,
- k) Maize and maize products,
- m) Any other edible cereal and its product,
- n) Rice bran (*see IS 3648*),
- p) Wheat bran,
- q) Edible vegetable oils,
- r) Soybean lecithin,
- s) Algal meals,
- t) Sea weeds,
- u) Corn gluten, and
- v) Sorgham meal.

B-1.3 Other Ingredients

- a) Vitamins,
- b) Minerals,
- c) Common salt (*see IS 920*),
- d) Dicalcium phosphate (*see IS 5470*),
- e) Yeast and Yeast extracts,
- f) Spirulina,
- g) Brewery by-products,
- h) Molasses (*see IS 1162*),
- j) Tapioca and its products,
- k) Binders,
- m) Single cell protein,
- n) Attractants,
- p) Nucleotides,
- q) Amino acids,
- r) Pigments,
- s) Toxin binders and Clay,
- t) Dunaliella,
- u) Antifungals,
- v) Peptiglycans,
- w) β -glucans, and
- y) Fuccoidan.

ANNEX C

[Table 1, Sl No. (vi) and Table 2, Sl No. (vi)]

DETERMINATION OF GROSS ENERGY

C-1 GENERAL

The bomb calorimeter provides a means of assessing

the amount of energy (gross) made available during the catalytic degradation of combustible solids, liquids and gases in a pressurized oxygen atmosphere. Gross

IS 16150 (Part 3) : 2014

energy is the amount of heat liberated when a substance is completely burnt to carbon dioxide and water. It is also known as heat of combustion.

C-1.1 Preparation of Sample Material

It is essential that the test sample is truly representative of the sample material. In general the sample material needs to be dried before combustion and here the sample characteristics will determine the method of drying to be used that is whether oven drying or vacuum drying at low temperature should be done before or after selection of a working sample. The drying process should not volatilize or destroy any of the combustible material. If complete dryness cannot be achieved easily without loss, preliminary tests should be made to determine the maximum water content at which this sample material can be ignited and completely burnt in the bomb. All material which have low bulk density and high surface area must be compacted.

C-2 PRINCIPLE

A known quantity of a sample is ignited electrically and burnt in excess of oxygen in the bomb. The maximum temperature rise is measured with the thermometers in a controlled system. By comparing this rise with that obtained when a sample of known calorific value is burnt, the calorific value of the sample material can be determined.

C-3 APPARATUS

C-3.1 Adiabatic Bomb Calorimeter

C-3.2 Pellet Press

C-3.3 Metallic Crucible

C-3.4 Hot Air Oven

C-3.5 Balance

C-3.6 Fuse Wire

C-3.7 Cotton Thread

C-3.8 Beaker

C-3.9 Burette

C-3.10 Pipette

C-3.11 Whatman Filter Paper No. 1

C-4 REAGENTS

C-4.1 Benzoic Acid (Calorimeter Grade, Gross Energy Content 6 318 cal/g)

C-4.2 Distilled Water

C-4.3 Oxygen Gas

C-4.4 Barium Hydroxide

C-4.5 Sodium Carbonate

C-4.6 Hydrochloric Acid

C-4.7 Methyl Red Indicator

C-4.8 Phenolphthalein Indicator

C-5 PROCEDURE

C-5.1 Determination of Bomb Equivalent

- a) Take about 0.35 g of benzoic acid and make a pellet with the help of a pellet press.
- b) Place the pellet in a pre-weighed metallic crucible. Weigh the pellet and crucible accurately.
- c) Put the bomb top on the stand. Thread a piece of fuse wire through the electrodes and tie a single strand of cotton to it. Keep the lengths of fuse wire and cotton thread constant in order to facilitate the calculation of calorific value.
- d) Swing the crucible into position, clamp the ring and arrange the ends of the cotton thread so that they are in contact with the sample.
- e) Pipette 1 ml of distilled water into the bomb.
- f) Place the electrode assembly into the bomb body ensuring that it fits correctly.
- g) Tighten the bomb closure ring by hand only.
- h) Fill the bomb to 25 atmospheric pressure with oxygen (oxygen must be free from hydrogen).
- j) Fill water into calorimetric vessel to submerge the bomb completely. The vessel and water should give a total mass of 3 kg. The quantity of water used is not critical but it must be constant for all tests to an accuracy of ± 0.5 kg.
- k) Place the bomb on three supports in the calorimeter vessel and check for the gas leakage that the bomb should not show any sign of gas leakage.
- m) Gently slide the top of the calorimeter console onto the bomb. Switch on the main and press down the bomb firing plug to contact the bomb.
- n) Adjust the initial temperature and press the fire switch.
- p) After 8 min read the temperature on main thermometer. Note final temperature when it stabilizes.

C-5.1.1 Calculation

$$\text{Bomb equivalent} = \frac{(6\ 318 \times M) + A}{T}$$

IS 16150 (Part 3) : 2014

where

M = mass of benzoic acid (g);

A = correction factor for wire and thread [heat of combustion of thread and wire may be taken as 3 962 cal/g and 1 400 cal/g (or 2.3 cal/cm) respectively]; and

T = rise in temperature ($^{\circ}$ C).

C-5.2 Gross Energy Estimation of Feed

Weight 0.5-1 g of finely ground representative sample and make a pellet with the help of pellet press. All the materials which have low bulk density and high surface area must be compacted to reduce their rate of combustion, or otherwise, it will lead to a false result due to loss of sample from the crucible, even more serious is the possibility that the combustion will be so rapid that it resembles an explosion. Weigh samples for dry matter determination at the time of pelleting. Put the pellet in a pre-weighed crucible and weigh again. Follow the steps (c) to (p) as described in C-5.1. Switch off the main switch. Remove the bomb from the vessel. Release pressure of the bomb using pressure release cap. Open the bomb and wash the electrodes and inside top and body of the bomb with distilled water. Collect these washing in a beaker for corrections for nitrogen and sulphur contents.

C-5.2.1 Calculation

$$\text{Gross energy (cal/g)} = \frac{(\text{Bomb equivalent} \times T) - A}{\text{Dry mass of sample (g)}}$$

where

T = rise in temperature; and

A = correction factors for wire, thread, nitrogen and sulphur.

C-5.3 Nitrogen and Sulphur Corrections

- a) Boil the washings (see C-5.2) collected in the beaker for 5 min
- b) Cool and titrate against N/10 Ba(OH)_2 solution using phenolphthalein indicator.
- c) Add 20 ml of N/10 Na_2CO_3 solution and boil again.
- d) Cool the contents and filter through Whatman filter paper No. 1 and give 2-3 washings with hot distilled water.
- e) Titrate the washings against N/10 HCl using methyl orange indicator.
- f) Heat liberated due to production of H_2SO_4 and HNO_3 , can be calculated by using the following factors:

1 ml of N/10 Ba(OH)_2 solution = 3.60 cal

1 ml of N/10 Na_2CO_3 solution = 1.43 cal

C-5.3.1 Calculation

Nitric acid correction (cal) = 1.43 ($B - C$)

Sulphuric acid correction = 3.60 [$A - (B - C)$]
(cal)

where

A = amount of N/10 Ba(OH)_2 solution used (ml),

B = amount of N/10 Na_2CO_3 solution added (ml), and

C = amount of N/10 HCl used (ml).

ANNEX D (Clause 4.5.2)

DETERMINATION OF WATER STABILITY OF SHRIMP FEED PELLETS

D-1 PRINCIPLE

Water stability of dry marine shrimp feed pellets is determined by the loss in mass of pellets kept in water for a specified time interval. The loss in mass of pellets indicates the stability, higher the loss poorer the stability.

D-2 APPARATUS**D-2.1 Oven****D-2.2 Nylon Mesh****D-2.3 Sieve (2.4 mm)****D-2.4 Balance****D-2.5 Glass Beaker (1 litre)****D-2.6 Stop Watch****D-3 PROCEDURE**

Wash cone shaped pouches made of nylon mesh (1 mm mesh size) thoroughly and dry at 70 $^{\circ}$ C to constant mass in an oven. Take about 2 g of feed

IS 16150 (Part 3) : 2014

pellets in each pouch and record exact initial mass. Take 5-6 such pouches for each sample. Place the pouches with feed pellets at the bottom of 1 litre beaker containing one litre seawater (30 parts per thousand). Record water temperature, salinity and pH of the seawater. After prescribed time, slowly take out pouches with pellets out of the water. Examine the pellets for their physical shape. Wash the adhering salt on the pellets by dipping in fresh water for 5 min. Dry the pouches with pellets at 70°C to constant mass.

Difference in the initial mass and final mass of the pellets gives loss in mass at 70°C.

D-4 CALCULATION

Water stability is calculated using the following formula:

$$\text{Percent water stability} = \frac{\text{Final mass (g)} \times \text{Percent dry matter}}{\text{Initial mass (g)} \times \text{Percent dry matter}} \times 100$$

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc No.: FAD 12 (2339).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
 Telephones : 2323 0131, 2323 3375, 2323 9402 Website: www.bis.org.in

Regional Offices:

		Telephones
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{ 2323 7617 2323 3841
Eastern	: 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700054	{ 2337 8499, 2337 8561 2337 8626, 2337 9120
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	{ 260 3843 260 9285
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600113	{ 2254 1216, 2254 1442 2254 2519, 2254 2315
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	{ 2832 9295, 2832 7858 2832 7891, 2832 7892

Branches: AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. DEHRADUN.
 FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. KOCHI.
 LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAJKOT. VISAKHAPATNAM.

IS 16150 (Part 4) : 2014

*Indian Standard***FISH FEED — SPECIFICATION****PART 4 FRESHWATER PRAWN (*Macrobrachium rosenbergii*) FEED****1 SCOPE**

This standard (Part 4) prescribes the requirements and the methods of sampling and test for freshwater prawn (*Macrobrachium rosenbergii*) feeds.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed in Annex A.

3 TYPES

The freshwater prawn feed shall be of the following types:

- Starter Grade* — A feed to be fed to post larvae of freshwater prawn in grow-out ponds until they attain a mass of about 7.0 g.
- Grower Grade* — A feed to be fed to growing prawn of about 7.0 g until they attain a mass of about 20 g.
- Finisher Grade* — A feed to be fed to growing prawn of above 20 g mass.

4 REQUIREMENTS**4.1 Description**

The feed shall be free from rancidity, adulterants, moulds and insect infestation.

4.1.1 Ingredients

The ingredients listed in Annex B shall only be used for manufacturing freshwater prawn feed.

4.2 The freshwater prawn feed shall also conform to the requirements given in Table 1.

4.3 Antibiotics and Additives

If antibiotics or other additives are incorporated into the freshwater prawn feed, these shall be declared on the label. The use of any of the following antibiotics and other Pharmacologically Active Substances shall be prohibited in any unit manufacturing feed for freshwater prawn:

- All nitrofurans including, furaltadone, furazolidone, furylfuramide, nifuratel, nifuroxime, nifurprazine, nitrofurnatoin, nitrofurazone;
- Chloramphenicol;
- Neomycin;
- Nalidixic acid;
- Sulphamethoxazole;
- Aristolochia spp. and preparations thereof;
- Chloroform;
- Chloropromazine;
- Cholchicine;
- Dapsone;
- Dimetridazole;
- Metronidazole;
- Ronidazole;
- Ipronidazole;

Table 1 Requirements for Freshwater Prawn (*Macrobrachium rosenbergii*) Feed
(Clauses 4.2 and 7.1)

Sl No.	Characteristics	Requirements			Method of Test, Ref to
		Starter (3)	Grower (4)	Finisher (5)	
(1)	(2)				(6)
i)	Moisture, percent by mass, <i>Max</i>	12	12	12	4 of IS 7874 (Part 1)
ii)	Crude Protein ($N \times 6.25$), percent by mass, <i>Min</i>	30.0	24.0	18.0	5 of IS 7874 (Part 1)
iii)	Crude fat, percent by mass, <i>Min</i>	4.0	4.0	4.0	7 of IS 7874 (Part 1)
iv)	Crude fibre, percent by mass, <i>Max</i>	8.0	8.0	10.0	8 of IS 7874 (Part 1)
v)	Phosphorus, percent by mass, <i>Max</i>	0.65	0.65	0.65	6 of IS 7874 (Part 2)
vi)	Acid insoluble ash, percent by mass, <i>Max</i>	5.0	6.0	6.0	10 of IS 7874 (Part 1)
vii)	Gross energy, kcal/kg, <i>Min</i>	2 800	3 000	2 800	Annex C

NOTE — The requirements specified for characteristics (ii) to (vii) are on moisture-free basis.

IS 16150 (Part 4) : 2014

- r) Other nitromidazoles;
- s) Clenbuterol;
- t) Diethylstibestrol (DES);
- u) Sulfanoamide drugs (except approved sulfadimethoxine, sulfabromomethazine and sulfaethoxypyridazine);
- v) Fluoroquinolones; and
- w) Glycopeptides.

4.4 Aflatoxin B₁ content of the freshwater prawn feed shall not exceed 0.05 mg/kg at the time of manufacture. Aflatoxin B₁ shall be tested by the manufacturer in accordance with the test method prescribed in IS 13427 or IS 14718* and declared on the label. Sampling of freshwater prawn feed for estimation of aflatoxin B₁ content shall be done in accordance with IS 13426.

NOTE — In case of dispute, the method indicated by '*' in 4.4 shall be the referee method.

4.5 Physical Characteristics

4.5.1 Feed Form and Size

4.5.1.1 Starter grade feed shall be in the form of crumbles or pellets of 0.6 mm to 2.0 mm diameter.

4.5.1.2 Grower grade and finisher grade feed shall be in the form of pellets of 2.2 mm to 2.5 mm diameter.

4.5.2 Water Stability of Pellets

The feed pellets should be stable without disintegration in water for 2 h minimum. The water stability shall not be less than 90 percent after 1 h when tested as per Annex D.

5 PACKING AND MARKING

5.1 Packing

The material shall be packed in clean, dry and polythene lined bags (jute or laminated paper bags). The mouth of each bag should be machine stitched or rolled over and hand stitched.

5.2 Marking

5.2.1 Each bag should be suitably marked so as to give the following information legibly:

- a) Name of the material and brand name, if any;
- b) Type of the prawn feed alongwith grade, sub-grade;
- c) Name and address of the manufacturer;

- d) Net quantity when packed;
- e) Batch or Code number;
- f) Date of manufacture; and
- g) Any other markings required under the *Legal Metrology (Packaged Commodities) Rules, 2011*.

5.2.2 In addition to the information given in 5.2.1, each bag shall have a label or tag attached to it or contain a leaflet giving the following information:

- a) Type of the prawn feed;
- b) Name and quantity of the antibiotic or additives added, if any;
- c) Moisture content;
- d) Crude protein content;
- e) Crude fibre content;
- f) Crude fat content;
- g) Aflatoxin B₁ content;
- h) Gross energy; and
- j) Direction for use.

5.3 BIS Certification Marking

The product may also be marked with the Standard Mark.

5.3.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations framed thereunder. The details of the conditions under which the licence for use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

Representative samples of the material shall be drawn according to the method prescribed in IS 1374.

7 TESTS

7.1 Tests shall be carried out as prescribed in 4.4, 4.5.2 and col 6 of Table 1.

■ QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities, which affect the result of analysis.

IS 16150 (Part 4) : 2014

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
920 : 1972	Specification for common salt and cattle licks for animal consumption (<i>first revision</i>)	3593 : 1979	(meal) as livestock feed ingredient (<i>second revision</i>)
1070 : 1992	Reagent grade water — Specification (<i>third revision</i>)		Specification for solvent extracted rice bran as livestock feed (<i>second revision</i>)
1162 : 1958	Specification for cane molasses	3648 : 1975	Specification for rice bran as livestock feed (<i>first revision</i>)
1374 : 2007	Poultry feeds — Specification (<i>fifth revision</i>)	4307 : 1983	Specification for fishmeal as livestock feed ingredient (<i>second revision</i>)
1712 : 1982	Specification for cottonseed oilcake as livestock feed ingredient (<i>second revision</i>)	5065 : 1986	Specification for meat meal as livestock feed ingredient (<i>first revision</i>)
1713 : 1986	Specification for decorticated groundnut oilcake as livestock feed ingredient (<i>second revision</i>)	5470 : 2002	Dicalcium phosphate, animal feed grade — Specification (<i>first revision</i>)
1932 : 1986	Specification for mustard and rapeseed oilcake as livestock feed ingredient (<i>second revision</i>)	5862 : 1970	Specification for solvent extracted nigerseed oilcake (meal) as livestock feed
1934 : 1982	Specification for sesamum oilcake as livestock feed ingredient (<i>first revision</i>)	6242 : 1985	Specification for solvent extracted undecorticated safflower oilcake as livestock feed ingredient (<i>first revision</i>)
1942 : 1968	Specification for bone-meal as livestock feed supplement (<i>first revision</i>)	7060 : 1973	Specification for blood meal as livestock feed
2151 : 1985	Specification for maize germ oilcake as livestock feed ingredient (<i>first revision</i>)	7874	Methods of tests for animal feeds and feeding stuffs:
2152 : 1972	Specification for maize gluten as livestock feed ingredient (<i>first revision</i>)	(Part 1) : 1975	General methods
2154 : 1986	Specification for coconut oilcake as livestock feed ingredient (<i>second revision</i>)	(Part 2) : 1975	Minerals and trace elements
3441 : 1982	Specification for solvent extracted groundnut oilcake (meal) as livestock feed ingredient (<i>first revision</i>)	13426 : 1992	Animal feeds and feeding stuffs — Methods of sampling for aflatoxin analysis
3591 : 1985	Specification for solvent-extracted coconut oilcake (meal) as livestock feed ingredient (<i>second revision</i>)	13427 : 1992	Animal feeds and feeding stuffs — Determination of aflatoxin B ₁ content
3592 : 1985	Specification for solvent extracted decorticated cottonseed oilcake	14718 : 1998	Animal feeding stuffs — Determination of aflatoxin B ₁ content of mixed feeding stuffs — Method using high performance liquid chromatography

IS 16150 (Part 4) : 2014

ANNEX B (Clause 4.1.1)

INGREDIENTS FOR FRESHWATER PRAWN FEED

B-1 In the compounding of freshwater prawn feed a variety of ingredients are used. This Annex gives a list of such ingredients.

B-1.1 Grain and Seeds

- a) Maize,
- b) Barley,
- c) Bajra,
- d) Wheat,
- e) Jowar,
- f) Oats,
- g) Ragi, and
- h) Rice/broken rice.

B-1.2 Grain By-products

- a) Rice bran or solvent extracted rice bran and polishings (*see IS 3648 and IS 3593*),
- b) Wheat bran,
- c) Maize gluten and maize gluten feed (*see IS 2152*),
- d) Grain sieving, and
- e) Corn gluten.

B-1.3 Oil Cakes and Meals

- a) Copra cake, coconut oilcake (expeller-pressed or solvent extracted) (*see IS 2154 and IS 3591*),
- b) Cottonseed oilcake (decorticated) (expeller-pressed or solvent extracted) (*see IS 1712 and IS 3592*),
- c) Groundnut oilcake (expeller-pressed or solvent extracted) (*see IS 1713 and IS 3441*),
- d) Maize germ oilcake (*see IS 2151*),
- e) Mustard and rapeseed oilcake (*see IS 1932*),
- f) Neemseed kernel cake,
- g) Salseed meal, solvent extracted,
- h) Safflower (*Canthamus tinctorius*) oilcake (expeller-pressed or solvent extracted) (*see IS 6242*),
- j) Sesame (*Sesamum indicum orientale*) oilcake

(expeller-pressed or solvent extracted) (*see IS 1934*),

- k) Soyabean meal (solvent extracted),
- m) Sunflower oilcake (decorticated or undecorticated),
- n) Niger seed oilcake (*see IS 5862*), and
- p) Sorgham meal.

B-1.4 Tubers and Roots

Tapioca flour

B-1.5 Animal Products

- a) Blood meal (*see IS 7060*),
- b) Fish meal (*see IS 4307*),
- c) Liver residue,
- d) Meat meal (*see IS 5065*) and meat scrap,
- e) Meat-cum-bone meal,
- f) Fish viscera meal,
- g) Chicken viscera meal,
- h) Silk worm pupae meal,
- j) Shrimp and shrimp head meal,
- k) Mollusc meat meal, and
- m) Bone meal (*see IS 1942*).

B-1.6 Minerals and Vitamins

- a) Dicalcium phosphate (*see IS 5470*),
- b) Common salt (*see IS 920*), and
- c) Vitamins (mineral stabilized).

B-1.7 Waste Material and Industrial By-products

- a) Brewers' grain,
- b) Dried yeast and yeast sludge, and
- c) Molasses (*see IS 1162*).

B-1.8 Other Ingredients

- a) Dunaliella,
- b) Antifungals,
- c) Peptiglycans,
- d) β -glucans, and
- e) Fuccoidan.

IS 16150 (Part 4) : 2014

ANNEX C
[Table 1, Sl No. (vii)]
DETERMINATION OF GROSS ENERGY

C-1 GENERAL

The bomb calorimeter provides a means of assessing the amount of energy (gross) made available during the catalytic degradation of combustible solids, liquids and gases in a pressurized oxygen atmosphere. Gross energy is the amount of heat liberated when a substance is completely burnt to carbon dioxide and water. It is also known as heat of combustion.

C-1.1 Preparation of Sample Material

It is essential that the test sample is truly representative of the sample material. In general the sample material needs to be dried before combustion and here the sample characteristics will determine the method of drying to be used that is whether oven drying or vacuum drying at low temperature should be done before or after selection of a working sample. The drying process should not volatilize or destroy any of the combustible material. If complete dryness cannot be achieved easily without loss, preliminary tests should be made to determine the maximum water content at which this sample material can be ignited and completely burnt in the bomb. All material which have low bulk density and high surface area must be compacted.

C-2 PRINCIPLE

A known quantity of a sample is ignited electrically and burnt in excess of oxygen in the bomb. The maximum temperature rise is measured with the thermometers in a controlled system. By comparing this rise with that obtained when a sample of known calorific value is burnt, the calorific value of the sample material can be determined.

C-3 APPARATUS**C-3.1 Adiabatic Bomb Calorimeter****C-3.2 Pellet Press****C-3.3 Metallic Crucible****C-3.4 Hot Air Oven****C-3.5 Balance****C-3.6 Fuse Wire****C-3.7 Cotton Thread****C-3.8 Beaker****C-3.9 Burette****C-3.10 Pipette****C-3.11 Whatman Filter Paper No. 1****C-4 REAGENTS****C-4.1 Benzoic Acid (Calorimeter Grade, Gross Energy Content 6 318 cal/g)****C-4.2 Distilled Water****C-4.3 Oxygen Gas****C-4.4 Barium Hydroxide****C-4.5 Sodium Carbonate****C-4.6 Hydrochloric Acid****C-4.7 Methyl Red Indicator****C-4.8 Phenolphthalein Indicator****C-5 PROCEDURE****C-5.1 Determination of Bomb Equivalent**

- a) Take about 0.35 g of benzoic acid and make a pellet with the help of a pellet press.
- b) Place the pellet in a pre-weighed metallic crucible. Weigh the pellet and crucible accurately.
- c) Put the bomb top on the stand. Thread a piece of fuse wire through the electrodes and tie a single strand of cotton to it. Keep the lengths of fuse wire and cotton thread constant in order to facilitate the calculation of calorific value.
- d) Swing the crucible into position, clamp the ring and arrange the ends of the cotton thread so that they are in contact with the sample.
- e) Pipette 1 ml of distilled water into the bomb.
- f) Place the electrode assembly into the bomb body ensuring that it fits correctly.
- g) Tighten the bomb closure ring by hand only.
- h) Fill the bomb to 25 atmospheric pressure with oxygen (oxygen must be free from hydrogen).
- j) Fill water into calorimetric vessel to submerge the bomb completely. The vessel and water should give a total mass of 3 kg. The quantity of water used is not critical but it must be constant for all tests to an accuracy of ± 0.5 kg.

IS 16150 (Part 4) : 2014

- k) Place the bomb on three supports in the calorimeter vessel and check for the gas leakage that the bomb should not show any sign of gas leakage.
- m) Gently slide the top of the calorimeter console onto the bomb. Switch on the main and press down the bomb firing plug to contact the bomb.
- n) Adjust the initial temperature and press the fire switch.
- p) After 8 min read the temperature on main thermometer. Note final temperature when it stabilizes.

C-5.1.1 Calculation

$$\text{Bomb equivalent} = \frac{(6318 \times M) + A}{T}$$

where

M = mass of benzoic acid (g);

A = correction factor for wire and thread [heat of combustion of thread and wire may be taken as 3 962 cal/g and 1 400 cal/g (or 2.3 cal/cm) respectively]; and

T = rise in temperature ($^{\circ}\text{C}$).

C-5.2 Gross Energy Estimation of Feed

Weight 0.5-1 g of finely ground representative sample and make a pellet with the help of pellet press. All the materials which have low bulk density and high surface area must be compacted to reduce their rate of combustion, or otherwise, it will lead to a false result due to loss of sample from the crucible, even more serious is the possibility that the combustion will be so rapid that it resembles an explosion. Weigh samples for dry matter determination at the time of pelleting. Put the pellet in a pre-weighed crucible and weigh again. Follow the steps (c) to (p) as described in C-5.1. Switch off the main switch. Remove the bomb from the vessel. Release pressure of the bomb using pressure release cap. Open the bomb and wash the electrodes and inside top and body of the bomb with distilled

water. Collect these washings in a beaker for corrections for nitrogen and sulphur contents.

C-5.2.1 Calculation

$$\text{Gross energy (cal/g)} = \frac{(\text{Bomb equivalent} \times T) - A}{\text{Dry mass of sample (g)}}$$

where

T = rise in temperature; and

A = correction factors for wire, thread, nitrogen and sulphur.

C-5.3 Nitrogen and Sulphur Corrections

- a) Boil the washings (see C-5.2) collected in the beaker for 5 min.
- b) Cool and titrate against N/10 Ba(OH)_2 solution using phenolphthalein indicator.
- c) Add 20 ml of N/10 Na_2CO_3 solution and boil again.
- d) Cool the contents and filter through Whatman filter paper No. 1 and give 2-3 washings with hot distilled water.
- e) Titrate the washings against N/10 HCl using methyl orange indicator.
- f) Heat liberated due to production of H_2SO_4 and HNO_3 can be calculated by using the following factors:

1 ml of N/10 Ba(OH)_2 solution = 3.60 cal

1 ml of N/10 Na_2CO_3 solution = 1.43 cal

C-5.3.1 Calculation

Nitric acid correction (cal) = 1.43 ($B - C$)

Sulphuric acid correction = 3.60 [$A - (B - C)$] (cal)

where

A = amount of N/10 Ba(OH)_2 solution used (ml);

B = amount of N/10 Na_2CO_3 solution added (ml); and

C = amount of N/10 HCl used (ml).

IS 16150 (Part 4) : 2014

ANNEX D
(Clause 4.5.2)

DETERMINATION OF WATER STABILITY OF FRESHWATER PRAWN FEED PELLETS

D-1 PRINCIPLE

Water stability of dry freshwater prawn feed pellets is determined by the loss in mass of pellets kept in water for a specified time interval. The loss in mass of pellets indicates the stability, higher the loss poorer the stability.

D-2 APPARATUS

D-2.1 Oven

D-2.2 Nylon Mesh

D-2.3 Sieve (2.4 mm)

D-2.4 Balance

D-2.5 Glass Beaker (1 litre)

D-2.6 Stop Watch

D-3 PROCEDURE

Wash cone shaped pouches made of nylon mesh (1 mm mesh size) thoroughly and dry at 70°C to constant mass in an oven. Take about 2 g of feed pellets in each pouch and record exact initial mass. Take 5-6 such pouches for each sample. Place the pouches with feed pellets at the bottom of 1 litre beaker containing 1 litre distilled water. Record water temperature. After prescribed time, slowly take out pouches with pellets out of the water. Examine the pellets for their physical shape. Dry the pouches with pellets at 70°C to constant mass. Difference in the initial mass and final mass of the pellets gives loss in mass at 70°C.

D-4 CALCULATION

Water stability is calculated using the following formula:

$$\text{Percent Water} = \frac{\text{Final mass (g)} \times \text{Percent dry matter}}{\text{Initial mass (g)} \times \text{Percent dry matter}} \times 100$$

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc No.: FAD 12 (2340).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
 Telephones : 2323 0131, 2323 3375, 2323 9402 Website: www.bis.org.in

Regional Offices:

		<i>Telephones</i>
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{ 2323 7617 2323 3841
Eastern	: 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700054	{ 2337 8499, 2337 8561 2337 8626, 2337 9120
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	{ 260 3843 260 9285
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600113	{ 2254 1216, 2254 1442 2254 2519, 2254 2315
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	{ 2832 9295, 2832 7858 2832 7891, 2832 7892
Branches:	AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. DEHRADUN. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. KOCHI. LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAJKOT. VISAKHAPATNAM.	

ANDHRA PRADESH FISH FEED (QUALITY CONTROL) RULES 2020
LIST OF FORMS
(See Rule 23)
ANNEXURE-II

S.NO	CONTENTS	New Form No	APSADA Rule No.
1	SERVICE REQUEST FORM FOR ENDORSEMENT OF LICENSE/ REGISTRATIONS OF AQUACULTURE BUSINESS OPERATIONS:	7	12(15) (i)
2	SERVICE REQUEST FORM FOR LICENSE FOR AQUACULTURE BUSINESS OPERATIONS	8	12(16) (i)
3	ENDORSEMENT ON LICENSE / REGISTRATIONS OF AQUACULTURE BUSINESS OPERATIONS	21	12(15) (iv)
4	LICENSE FOR AQUACULTURE BUSINESS OPERATIONS	22	12(16) (iv)
5	REJECTION FOR ISSUE OF LICENSE/ENDORSEMENT FOR AQUACULTURE FARMS/ AQUACULTURE BUSINESS OPERATIONS.	23	12
6	SERVICE REQUEST FOR APPROVAL OF NEW FISH INGREDIENT OR PRODUCT/ FISH FEED FOR NEW SPECIES	24	15(7)
7	NOTICE TO LICENSEE FOR SAMPLE COLLECTION	25	18(1) (ii)
8	ACKNOWLEDGEMENT TO LICENSEE FOR THE SAMPLE COLLECTED	26	18(1) (iv)(a)
9	SAMPLE SENT TO REGIONAL LABORATORY FOR ANALYSIS	27	18(1) (iv)(b)
10	SAMPLE SENT TO REFERRAL LABORATORY FOR ANALYSIS	28	18(1) (iv)(c)
11	SERVICE REQUEST FORM BY LICENSEE FOR SENDING THE SAMPLE TO PRIVATE LABORATORY APPROVED BY THE GOVERNMENT FOR ANALYSIS	29	18(1) (iv)(e)
12	FORM FOR FORWARDING THE REQUEST OF LICENSEE FOR ANALYSIS TO ANY OTHER GOVT APPROVED LABORATORY	30	18(1) (iv)(e)
13	ADDITIONAL SAMPLE SENT TO REGIONAL LABORATORY FOR ANALYSIS ON REFUSAL TO	31	18(1) (iv)(f)

ACCEPT SAMPLE BY THE LICENSEE			
14	REPORT OF SAMPLE ANALYSIS	32	19 (7)
15	SERVICE REQUEST FORM BY LICENSEE FOR TESTING OF SAMPLE IN REFERRAL LABORATORY ON THE RESULT OF REGIONAL LABORATORY	33	20(2)
16	RECORD /REPORT OF INQUEST	34	21 (9)
17	INSPECTION REPORT AFTER INQUEST	35	21 (10)
18	SERVICE REQUEST FORM FOR CERTIFICATION OF FEED MANUFACTURING PLANTS	37	23 (3) (i)
19	INSPECTION REPORT FOR CERTIFICATION OF THE FEED MANUFACTURING PLANT	39	23 (3) (v)
20	CERTIFICATION OF FEED MANUFACTURE PLANT	41	23 (3) (ix)
21	SERVICE REQUEST FORM FOR CERTIFICATION OF FEED	43	23 (4) (i)
22	TECHNICAL AGENCY INSPECTION REPORT FOR CERTIFICATION OF FEED	45	23 (4) (x)
23	CERTIFICATION OF FEED	47	23 (4) (xi)
24	NOTICE TO THE LICENSEE FOR SEIZURE AND FORFEITURE OF THE PROPERTY	48	25 (1)
25	SHOW-CAUSE NOTICE FOR SUSPENSION / CANCELLATION OF LICENSE	49	26 (1)
26	SUSPENSION / CANCELLATION OF LICENSE	50	26 (5)
27	RECTIFICATION SUBMISSION BY LICENSEE TO REVOKE LICENSE	51	26 (5)
28	APPEAL TO THE APPELLATE AUTHORITY ON THE ORDER PASSED BY THE LICENSING AUTHORITY	52	27 (1)
29	NOTICE TO THE APPELLANT BY THE APPELLATE AUTHORITY TO APPEAR IN PERSON	53	27 (2)
30	DISPOSAL OF APPEAL BY APPELLANT AUTHORITY	54	27 (3)

Dr. POONAM MALAKONDAIAH,
Special Chief Secretary to Government (FAC).

ANDHRA PRADESH FISH FEED (QUALITY CONTROL) RULES 2020**ANNEXURE-III**

(See Rule 7)

1. REFERRAL FISH FEED ANALYSIS LABORATORY

Sl. No.	District	Location of the Laboratory	Facility available				
			Feed Lab (both Conventional and NIR)	PCR (both nested and RT-PCR)	ELISA	LC MSMS	GC MSMS
1).	East Godavari	SIFT, Jagannaikpur Kakinada	7.	7.	7.	7.	

2. REGIONAL FISH FEED ANALYSIS LABORATORIES

Sl. No	District	Location of the Laboratory		Facility available
1.	Srikakulam	1	Office of the JD Fisheries, Illishpuram, Srikakulam	Feed analysis lab (Conventional)
2	Visakhapatnam	2	AMC Payakaraopeta, Visakhapatnam	Feed analysis lab (Conventional)
3	East Godavari	3	Beside Veterinary Training Institute, Idarapalli, East Godavari	Feed analysis lab (Conventional)
4	West Godavari	4	AMC Bhimavaram	Feed analysis lab (Conventional)
		5	AMC Palakollu	Feed analysis lab (Conventional)
5	Krishna	6	Govt. lab existing at Office of AD Fisheries, Kaikaluru	Feed analysis lab (Conventional) & NIR
		7	AMC Gudiwada	Feed analysis lab (Conventional)
		8	AMC Machilipatnam	Feed analysis lab (Conventional)
		9	AMC, Kankipadu	Feed analysis lab (Conventional) & NIR
6	Guntur	10	AMC, Repalle	Feed analysis lab (Conventional)
7	Prakasam	11	AMC, Singarayakonda	Feed analysis lab (Conventional)
		12	AMC, Ongole	Feed analysis lab (Conventional)

8	SPSR Nellore	13	MRO office premises, Kavali	Feed analysis lab (Conventional)
		14	Office of the JDF , Nellore	Feed analysis lab (Conventional)

3. LIST OF EQUIPMENT AND FACILITIES REQUIREMENT IN REFERAL FISH FEED ANALYSIS LABORATORY AND REGIONAL FISH FEED ANALYSIS LABORATORIES

1).Feed and Feed Ingredients Analysis Lab	
Equipments& Instruments	Hot air Oven, Kjeldhal digestion and distillation System, Soxhlet system, Fibretec system, Muffle Furnace.
Lab facilities	Furniture, Desk top, Glassware, Plastic ware, Cupboard& racks etc. and Test Kits. Partition for sample collection, preservation room for samples & chemicals , Feed analysis chamber, water supply, Electricity arrangements, Cupboard& racks etc. safety arrangements for instruments as per Standard Operating Procedures
2) Antibiotics Residue Testing Labs (LC MS MS Labs)	
Equipments& Instruments	LC MS MS Complete Unit- with Mass spectroscopy, HPLC, UPS, vacuum pump, computer system, Argon gas cylinder, columns with 5 year warranty on the machine, Cooling Centrifuge 11,200 rpm, Orbital Shaker, Autoclavable Pipettes Electronic-set 1-10 ul, 10-100 ul 100-1000 ul, 10 ml, Oil free Compressor, Nitrogen Evaporator, Sonicator.
Lab facilities	Furniture, Desk top, Glassware, Plastic ware and Test Kits & AC unit. Partition for sample testing, sample preservation room, sample preparation room, result analysis chamber, water supply, Electricity arrangements, Cupboard& racks etc. safety arrangements for instruments as per Standard Operating Procedures
3) ELISA	
Equipment	ELISA Machine
Lab facilities	Furniture, Desk top, Glassware, Plastic ware and Test Kits, AC unit Partition for sample collection room , sample preparation room, sample testing room , water supply, Electricity arrangements, Cupboard& racks etc. safety arrangements for instruments as per Standard Operating

Procedures	
4) GCMS MS	
Equipment	GCMS MS Equipment
Lab facilities	Furniture, Desk top, Glassware, Plastic ware and Test Kits Lab arrangements(partition of chambers, Electricity, Water supply ,platform etc) safety arrangements for instruments as per Standard Operating Procedures
5) NIR Lab	
Equipment	NIR Equipment.
Lab facilities	Furniture Requirement, Desk top, Tables & Lab furniture ,AC unit Electricity, Water supply, platform ,safety arrangements for instruments as per Standard Operating Procedures

4. User Charges for Analysis Testing at Regional and Referral Laboratories under the APSADA Rules, 2020

Sl. No.	Parameters	Fee
A. Feed analysis Charges:-		
1	Protein	200
2	Fat	180
3	Fiber	180
4	Ash	60
5	Moisture	60
6	Sand silica	80
7	All parameters	760
8	Feed analysis by NIR All parameters (Protein, fat, fibre, ash, moisture)	200
9	Atomic Spectroscopy: Aflo-toxins in feeds	3000
Antibiotics Residue Analysis Charges (ELISA):		
10	Chloramphenicol	1500
11	Nitrofuran metabolite – AOZ	1500
12	Nitrofuran metabolite-AMOZ	1500
13	Nitrofuran metabolite -AHD	1500
14	Nitrofuran metabolite - SEM	1500
15	Malachite green	1500
16	Crystal violet	1500
17	Sulphonamides (each compound)	1500

18	Tetracyclines (each compound)	1500
LCMSMS & GC MSMS Method:		
19	Dyes (MG, LMG, CV, and LCV)	7000
20	Antibiotics: (AOZ, SEM, AHD, AMOZ)	3500
21	Sulphonamides (11 compounds)	4000
22	Fluoroquinolones (9 compounds)	4000
23	Chloramphenicol	1700
24	Tetracycline with 4 epimers (3 compounds)	3500
25	Nitroimidazoles	3500
26	Oxalinic acid and Nalidixic acid	2300
27	Organochlorine pesticides group and NDL PCBs	4700
28	Steroids and Stillbenes (6 compounds)	5500
29	Aflatoxin (B1& B2)	2300
30	Formaldehyde	1200
31	Anthelmintics (Ivermectin & Emamectin)	2800
32	Heavy metals (As, Hg, Pd & Cd)	2300

Dr. POONAM MALAKONDAIAH,
Special Chief Secretary to Government (FAC).

ANDHRA PRADESH FISH FEED (QUALITY CONTROL) RULES 2020**ANNEXURE- IV**

(See Rule 8(1))

**GENERAL REQUIREMENT TO BE COMPLIED BY FISH FEED
MANUFACTURING PLANTS AND DISTRIBUTORS****I. Premises design and facilities recommended practices**

1. Location: Away from polluted areas, areas subject to flooding, pest infestations and presence of wastes
2. Design and layout: In general, 20 feed bags, each of 50kg, require 1cubic meter space. Physical separation of activities that can cause contamination. Covering and protection of intake and loading facilities. Sufficient space to conduct operations. No cross-connection between sewage and drainage systems
3. Internal structures and fittings: Walls, doors and partitions with smooth surface. Windows fitted with removable and cleanable screens. Floors with adequate drainage
4. Equipment: Made of nontoxic materials. Easy to disassemble, clean and maintain.
5. Water supply: Potable water, where needed, according to WHO guidelines Monitored and controlled chemical treatment
6. Drainage and waste disposal: Constructed not to cross-connect with potable water
7. Cleaning facilities: Corrosion resistant and easily cleanable.
8. Hygiene facilities: Provided with means for washing and drying hands. Hand wash basins near toilets. Availability of soap and paper towels. Constant supply of potable water. Availability of protective clothing
9. Air quality, temperature and ventilation: Control of temperature, humidity and ventilation, where necessary.
10. Lighting: Adequate artificial or natural lighting sources Protected lighting fixtures(Recommended lighting: *540 lux in inspection areas *220 lux in work areas *110 lux in other areas)
11. Storage: A wooden platform of height 150 to 200 mm is prepared above the floor of storage shed to avoid the direct contact between the floors and feed bag. Permit adequate maintenance, cleaning and inspection activities. Separate areas for rejected products, waste material and chemicals. **This condition is exempted for VDF floor storage**
12. Rodent proofing: Rodent proofing of go-down can be enforced by closing, protecting and preventing access to rats by using structural materials. Suitable guards are provided to check climbing, preventing entry through foundations, walls, floor, roofs, ventilators, doors, windows, etc. Fire extinguishers are fixed
13. Whether Fire extinguishers are fixed and fixing of 'No smoking boards'
14. Whether building insured or not

II. Examination of the existing stock condition

1. Observation on Infestation: A careful and close examination for the presence of weevils, worms, moulds, fungal growth, rancid odour etc., is required. Evidence of damage to bags by rats and birds Squirrels, rats and mice should be traced minutely.
2. Deterioration in quality: Record moisture content, rancidity, mould and fungal growth
3. Whether rats and birds problem addressed Control rodents is as per the Prevention of Food Adulteration (PFA) as mentioned below;
 - i. Trapping: Various types of rat traps can be used for killing the rats
 - ii. Poison baiting using rodenticides like barium carbonate, zinc phosphate, red squill, phosphorus, tomorin, sodium fluoro-acetate etc.
 - iii. Spraying is done to control light infestation. DDT/ lindane formulation, malathion, DDVP (Nuvon) are the usual insecticides used for spraying. DDVP can be used as 300 ppm solution to spray over the stacks and malathion 5per cent can be sprayed on the floor and walls ups to 9 ft. height.
 - iv. Fumigation: In case of heavy and very heavy infestation whether fumigation carried out or not. For this the stacks is covered with aluminum coated rubber sheets to make the stacks airtight and fumigation is done by supplying fumigants (e.g. aluminum phosphide) to the stacks. Some of the fumigants used in cattle feed plants are listed below:
 - a. ED: CT mixture 30 to 35 tables / 1,000 sq. ft. for 48 hours every 3 months.
 - b. EDB and MB mixture 1 to 3 tables/1,000 cu ft.
 - c. Celphos tables – 2 tabs/ton
 - d. 16 per cent lindane in a smoke generator.
 - v. To assess the extent of infestation about 3 kg samples should be collected from different stacks, sieved and examined;

General guidelines for insect infestation	
Clean	No insects in stocks or in the sieved sample or the sample incubated for 3 weeks
Light	2 to 3 adult insects in the sample with 1 per cent damaged grains
Medium	5 to 10 adult insects with 3 per cent damaged grains
Heavy	Crawling insects on the stacks, 10 to 20 adult insects in one kg sample, 5 per cent damaged grains
Very heavy	5 per cent damaged grains 10 to 20 adults in 100 g sample

4. Any Weight losses from the weight mentioned on the bag
5. Proper Staking of different materials is followed;
 - i. Height of stack should not be more than 18 bags
 - ii. Size of stacking of bags should not be more than 5 M in length and 3 M in width
 - iii. There should be a minimum gap of 600 mm between two consecutive lots to ensure proper air circulation
 - iv. The stack should not touch the walls of shed and it should be considerably 300 mm away from the external walls
 - v. For each stack date of placing should be noted to know their period of storage.

-
- vi. To avoid rise in temperature in silos, aeration system (in case of grain silo) should be operated in night instead of in day time for better cooling efficiency.
 - vii. In case of DORB storage silos, re-circulation shall compulsorily be done at a regular interval at least once a day
 - viii. Whether First in and First out system is followed

Dr. POONAM MALAKONDAIAH,
Special Chief Secretary to Government (FAC).

ANDHRA PRADESH FISH FEED (QUALITY CONTROL) RULES 2020
ANNEXURE- V
(See Rule 11(5))

List of adulterants and their permissible level

If any unapproved ingredients are found in the feed, the feed will be considered as adulterated. However, there is a chance of occurrence of some of the chemical /extraneous substances through approved ingredients also. Therefore, the following indicative list of permissible levels is given:-

The Fish Feed Quality Control Committee shall be empowered to modify the list of adulterants and their tolerance levels.

S.No.	Name of the Substance	Permissible level (ppm)
1.	Urea	Nil
2.	Tannin	Nil
3.	Melamine	Nil

1. Inorganic contaminants and nitrogenous compounds:

Sl. No.	Undesirable substance	Maximum permissible limit (ppm)
1	Arsenic	10
2	Cadmium	1
3	Fluorine	350
4	Lead	5
5	Nitrite	15
6	Mercury	0.2

2. Mycotoxins:

Sl. No.	Undesirable substance	Maximum permissible limit (ppm)
I	Aflatoxin B1	0.01

3. Inherent Plant Toxins:

Sl. No.	Undesirable substance	Maximum permissible limit (ppm)
1	Free gossypol	20
2	Hydrocyanic acid	50
3	Volatile mustard oil	150

4. ORGANOCHLORINE COMPOUNDS (EXCEPT DIOXINS AND PCBs);

Sl. No.	Undesirable substance	Maximum permissible limit (ppm)
1.	BHC	0.03
2.	Aldrin	0.03
3.	Dieldrin	0.02
4.	Endrin	0.03
5.	DDT	0.50
6.	Endosulfan	0.005

5. DIOXINS AND PCBs;

Sl. No.	Undesirable substance	Maximum permissible limit (ppm)
1.	Dioxins	1.75
2.	Sum of dioxins and dioxin-like PCBs	5.5
3.	Non-dioxin-like PCBs	40

A	Substance	Maximum Permissible Residual Levels (in ppm)
	Antibiotics and other Pharmacologically Active Substances	
1.	Chloramphenicol	Nil
2.	Nitrofurans including: Furaltadone, Furazolidone, Furoxone, Nifuratel, Nifuroxime, Nifurprazine, Nitrofuran, Nitrofurazone	Nil
3.	Neomycin	Nil
4.	Nalidixic acid	Nil
5.	Sulphamethoxazole	Nil
6.	Aristolochia spp. And preparations thereof	Nil
7.	Chloroform	Nil
8.	Chlorpromazine	Nil
9.	Colchicine	Nil
10.	Dapsone	Nil
11.	Dimetridazole	Nil

12.	Metronidazole	Nil
13.	Ronidazole	Nil
14.	Ipronidazole	Nil
15.	Other nitroimidazoles	Nil
16.	Clenbuterol	Nil
17.	Diethylstilbestrol (DES)	Nil
18.	Sulfonamide drugs (except approved Sulfadimethoxine, Sulfabromomethazine and Sulfaethoxypyridazine)	Nil
19.	Fluroquinolones	Nil
20.	Glycopeptides	Nil
21.	Tetracycline	Nil
22.	Oxytetracycline	Nil
23.	Trimethoprim	Nil
24.	Oxolinic acid	Nil
B	Substances having anabolic effect and unauthorised substances	
1.	Stilbenes, Stilbene derivatives and their salts and esters.	Nil
2.	Steroids	Nil
C	Veterinary drugs	
1.	Antibacterial substances, including quinolones	Nil
2.	Ante helminitic	Nil

Dr. POONAM MALAKONDAIAH,
Special Chief Secretary to Government (FAC).

ANDHRA PRADESH FISH FEED (QUALITY CONTROL) RULES 2020

ANNEXURE- VI

(See Rules 19, 20(1), 22(1))

LIST OF OFFENSES & PENALTIES AND APPEAL CHARGES

Note: Sufficient documentary evidence (such as invoices, photos, videos, lab reports, enquiry report, inquest report, geo-coordinates and others) shall be uploaded by the Fish Feed Inspector or sample collector)

S.No.	Offense	Penalty					Appeal
		Suspension of license	Seizure of stock	Cancellation of license	Fine by dept.	Prosecution (Fine/imprisonment/forfeiture)	
1.	Doing Fish Feed Business without licence	-	Yes	-	Rs. 5,00,000	Yes	-
2.	Distribution/Sale of unapproved fish feed (1 st instance)	-	Yes	-	Rs. 2,00,000	-	-
3.	Distribution/ Sale of unapproved fish feed (2 nd instance)	Yes	Yes	-	Rs. 5,00,000	Yes	Yes
4.	In the case of fish feed made for sales in other states of India / export to other countries is distributed / sold in the Andhra Pradesh state (1 st instance)	-	Yes	-	Rs. 2,00,000	-	-
5.	In the case of fish feed made for sales in other states of India / export to other countries is distributed / sold in the Andhra Pradesh state (2 nd instance)	Yes	Yes	-	Rs. 5,00,000	Yes	Yes
6.	The License was obtained by concealment or misrepresentation as to an essential fact/s;	-	Yes	Yes	Rs. 1,00,000	-	Yes
7.	Preventing FFI from exercising his/her powers (1 st time)	-	-	-	Rs. 25,000	-	-

8.	Preventing FFI from exercising his/her powers (2 nd time)	Yes	-	-	Rs. 50,000	-	Yes
9.	Preventing FFI from exercising his/her powers (3 rd time)	-	Yes	Yes	Rs. 1,00,000	Yes	Yes
10.	Not providing fish feed samples when FFI asks for (1 st time)	-	-	-	Rs. 25,000	-	-
11.	Not providing fish feed samples when FFI asks for (2 nd time)	Yes	-	-	Rs. 50,000	-	Yes
12.	Not providing fish feed samples when FFI asks for (3 rd time)	-	-	Yes	Rs. 1,00,000	Yes	Yes
13.	Physical attack on FFI or any other staff while performing his/her duty	Yes	Yes	-	Rs. 50,000	Yes	-
14.	Sale of expired feed	Yes	Yes	-	Rs. 50,000	Yes	Yes
15.	Sale of feed without proper label	Yes	Yes	-	Rs. 50,000	Yes	Yes
16.	Adulteration in feed proved by test report	-	Yes	Yes	Rs. 50,000	Yes	Yes
17.	Sub-standard feed proved by lab report for the 1 st time during the license period	-	Yes	-	Rs. 2,00,000	-	-
18.	Sub-standard feed proved by lab report for 2 nd time during the license period	Yes	Yes	-	Rs. 5,00,000	-	Yes
19.	Sub-standard feed proved by lab report for 3 rd time during the license period	-	Yes	Yes	Rs. 10,00,000	Yes	Yes
20.	If licensee carryout any fish feed business operations other than for which license is obtained	Yes	Yes	-	Rs. 1,00,000	-	Yes
21.	In case of fish feeds produced in other states / countries and contains adulterants, action to be taken on the licensee (1 st instance)*	Yes	Yes	-	Rs. 1,00,000	-	Yes

22.	In case of fish feeds produced in other states / countries and does not comply with the approved standards, action to be taken on the licensee (2 nd instance) *	-	Yes	Yes	Rs. 2,00,000	-	Yes
23.	Any other violation under Fish Feed Act / Rules	Yes	Yes	-	Rs. 50,000	-	Yes

24. Fee to be paid for appeal : Rs. 5,000/- per appeal

*in the case of presence of adulterants / non-compliance to standards in imported fish feeds (from other states/other countries) distribution / sale of such feed will be banned in the state.

Note:

1. If the distributor / vendor deals with fish feed of more than one company, suspension or cancellation of his/her license will be limited to the particular company whose fish feed product found to have violated provisions of the act or rules made under the act. Therefore, the dealer / vendor may continue to do business of other companies.
2. In case of stoking/sale of adulterated/substandard feed by any dealer/vendor, the feed manufacturer is also liable for punishment along with the “dealer/vendor”

Dr. POONAM MALAKONDAIAH,
Special Chief Secretary to Government (FAC).

---X---